The Iron Age

A Review of the Hardware and Metal Trades.

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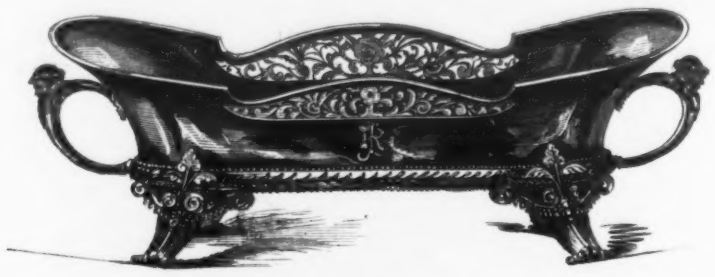
The Roach Testimonial.

Through the courtesy of the Gorham Manufacturing Company, we are enabled to present this week the first illustration which has been given to the public of the service of silver presented to Mr. John Roach, in recognition of his enterprise in establishing upon a successful basis the business of iron shipbuilding in this country. As our readers will remember, this testimonial was presented to Mr. Roach at a dinner given in his honor on the evening of Thursday, April 30, at Delmonico's, in this city, by the leading ship owners and merchants of New York and others interested in the re-establishment of our commerce.



SILVER SERVICE PRESENTED TO JOHN ROACH, APRIL 30, 1874. DESIGNED AND EXECUTED BY THE GORHAM MFG. CO.

The service consists of a coffee urn, hot water kettle, after-dinner coffee pot, tea pot, sugar bowl, slop bowl, a large fruit dish and a salver. The salver is 22x30 inches in size and oval in form. The rim is protected by a raised balustrade, with an open-work tracery of the Corinthian order of ornamentation. This tracery is of gold. At the sides of the salver are half oval plaques or medallions, bearing a bass-relief of the new iron steamship City of Pekin. The handles at the ends are of oxidized silver, and ornamented in harmony with the general design.

The surface of the salver has an engraving of the shipyard at Chester, Pa., with a view of the launch of the City of Pekin. At either end are allegorical designs representing commerce, and also a view of the Morgan Iron Works, in this city. Above these engraved designs is the following inscription: "Presented to John Roach, April 30, 1874, in recognition of his eminent services to the commercial interests of the United States in promoting and sustaining iron shipbuilding." Around this inscription and accompanying engravings is an ornamental scroll border, on which are given the names of the eighty-two subscribers to the testimonial. The names are so artistically worked into the design that the lettering appears simply as an ornamental part of it. The names are:

Ætna Iron Works.
W. D. Andrews & Brother.
W. C. Allison & Sons.
W. H. Bailey.
Capt. F. R. Baby.
John Baird.
Benoit & Wood.
E. W. Barston & Son.
Capt. D. S. Babcock.
Hon. H. C. Calkin.
Cobanks & Theall.
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Knight, Hart & Smith,
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Henry Levrat.
Murphy & Co.
J. P. Manton.
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F. W. Moss.
Jordan L. Mott.
Thomas Main.
C. H. Mallory & Co.
Capt. Charles Macdonald.
Ogden & Co.
Old Dominion S. S. Co.
Pollock & Van Wagenen.
C. E. Pennock & Co.
Phœnix Iron Works.
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Pettee & Mann.
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Passaic Rolling Mill Co.
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Ed. A. Quintard.
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E. P. Stratton.
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C. T. Raynolds & Co.
Geo. H. Reynolds.
Lee, Gar & Reed.
J. A. Roebling Sons.
Com. C. K. Garrison.
A. S. Cameron.

The next object of importance in the group is the fruit dish, which is of a graceful oblong form supported upon feet of a scroll pattern, and with open work sides, inlaid with gold. The handles are of rich design and ornamented with Egyptian heads. The general design and finish of the smaller objects are of the Egyptian style of workmanship. They all rest upon winged sphinxes, and are ornamented with heads and other designs studied from Egyptian antiquities. The ground work of the several objects is finished in frosted silver, while the raised parts, heads, etc., are of gold. The salver alone weighs three hundred ounces, and the other objects are equally massive.

The designing and carving of this service are in the highest degree artistic, and the Gorham Manufacturing Company are justly entitled to great credit for the taste and judgment they have displayed in executing an order for so costly a work in which so much was necessarily left to them. Probably nothing finer was ever made in silver. American workmanship in this metal is acknowledged to be superior to that of any other country, and the Gorham Company have, by this crowning success, excelled all previous efforts.

It is scarcely necessary to speak in this connection of a gentleman so well known as the recipient of this testimonial, but to those who know him only by reputation a brief sketch will be of more than ordinary interest. Mr. John Roach is by birth an Irishman, and about 60 years of age. He has lived in our country for 46 years, and has as much genuine American feeling, and as comprehensive an appreciation of his adopted land, as though he were a native thereof. The hight to which a man may attain in this world is perhaps a matter of opinion, to a certain extent, since every one is disposed to award the measure of greatness to an individual mainly according to the preference of the person forming the opinion for a given department of the world's affairs. But irrespective of the sphere in which he wrought his conspicuous success, Mr. Roach may justly claim that, whoever else may have achieved great ends, it would be impossible for any man to begin a career with less than he had to start him in life. He has worked as a laborer in an iron mine, and in every department of a foundry and machine shop, and from those positions up to the head of American iron shipbuilding—an industry in which several millions are invested to-day, but which virtually had no existence five years ago. All that he now possesses he has won by ability, perseverance and integrity, and by his power of inspiring others with confidence. He has always been very popular with his workmen, and he is a comprehensive, exact and eloquent speaker on subjects relating to his trade. Mr. Roach is of sandy complexion, wears no whiskers, is about 5 feet 9 inches in hight, is of strong build, and weighs about 165 lbs. He is a pleasant, keen and facile conversationist, his hair is gray only in part, and his vigor seems very slightly diminished by 45 years of hard work, both as laborer and capitalist.

At a recent meeting of German engineers a new method of joining gas pipes was described, which may interest some of our readers: Instead of the usual projecting end, the pipes have creases or channels around them. When placed in contact, end to end, a strip of soft lead is bound about them, and pressed tightly against the pipes by a wrought iron ring. The advantages claimed are that the pipes are lighter and more easily cast; less lead is required to make the joint tight; no heat is required for applying it; it is quickly done; and especially that the joint is somewhat elastic, and will last longer in soft ground, or when heavily loaded.

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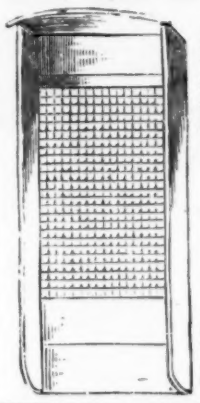

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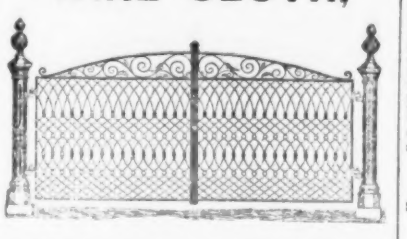

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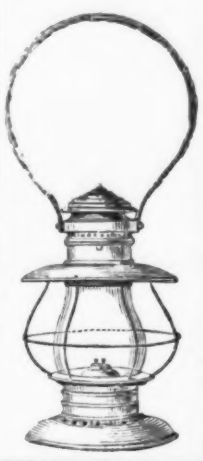

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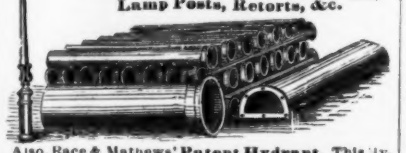

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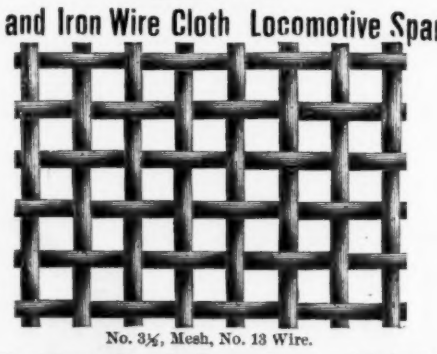

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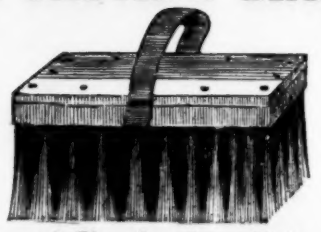

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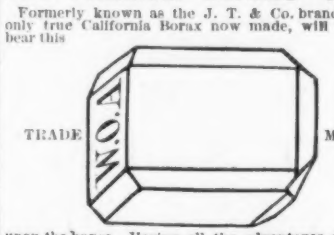

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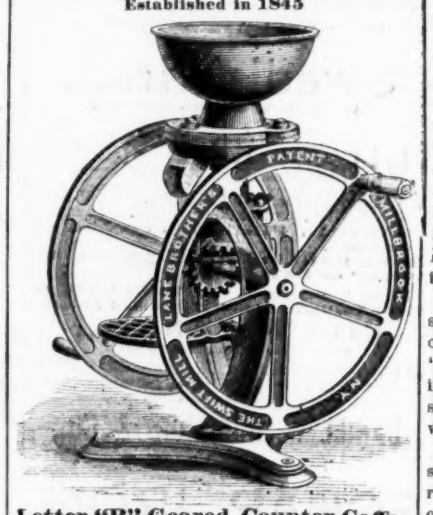

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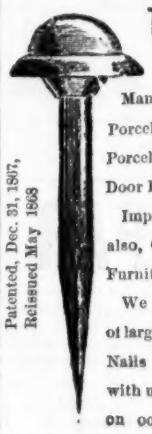

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Notes on the Properties of Metals.

III.

OXIDATION.

In the preceeding articles of this series we gave some interesting items of information on the characteristics of metals in general. We shall now speak more specifically of the metals most commonly employed in manufacturing and the arts.

IRON.

Iron, of which the chemical symbol is Fe., an abbreviation of its Latin name, *ferrum*, is the most abundant of all the metals, excepting alluminum. In its native form it is rarely found, except in meteoric stones and in platinum ores; but the ores of iron—the oxides, sulphides, etc.—are liberally distributed all over the globe. A familiar and easy mode of obtaining pure iron in the laboratory is by heating the proto-chloride in a glass tube, through which a current of hydrogen is passed.

The ore richest in the metal is the *magnetic*, which is chemically known as the black oxide of iron.

The rich specular and other iron ores of Spain and Elba were much used by the Romans; in Greece, also, iron was known, and the ancient Britons also employed it for the manufacture of lance and spear heads. Until 1618 the only fuel used in smelting iron was charcoal.

Iron has very powerful affinities for most of the non-metallic elements, and notably for oxygen, carbon phosphorus, sulphur, chlorine, bromine and iodine.

As a description of modes of iron manufacture would far exceed the limits of the present article, we are obliged to forego entering upon it.

Steel is an alloy of iron, which is, or may be, cast while in a molten state into a malleable ingot. This is the briefest and most concise definition of steel which can be given, and will serve our purpose in this instance better than one inviting a discussion of its chemical constitution.

COPPER.

The word copper is derived from the Island of Cyprus, where it was first wrought by the Greeks. The best method of obtaining it pure is to dissolve it in nitric acid; the solution is then diluted, and a piece of iron introduced, upon which the pure metal is precipitated, any adherent particles of iron being readily removed by washing with dilute sulphuric acid. Another method has lately been discovered of purifying copper, namely, by melting 100 parts of it with 10 parts of copper scales (black oxide), along with 10 parts of ground bottle-glass, or other flux. Mr. Lewis Thompson, who received a gold medal from the Society of Arts, for this invention, says that, after the copper has been kept in fusion for half an hour, it will be found at the bottom of the crucible, perfectly pure, while the iron, lead, arsenic, &c., &c., with which this metal is usually contaminated, will be oxidized by the scales, and will dissolve in the flux, or be volatilized. Thus he has obtained perfectly pure copper from brass, bell-metal, gun-metal, and several other alloys, containing from 4 to 50 per cent. of iron, lead, bismuth, antimony, arsenic, &c. The scales of copper are cheap, being the product of every large manufactory. Copper melts at a white heat, and by slow cooling may be crystalized. Its specific gravity is 9, nearly. It melts at a temperature of 1996° Fahr.

The reduction of copper ore is made by several consecutive processes. The first is by calcining it, and, when the ore is sufficiently "roasted" to oxidate the iron which it contains, it is smelted. The melted metal is, after a time, suffered to flow into a pit filled with water, by which it becomes granulated.

It then undergoes further heating, its slag, or scoria, is taken off, and it is allowed again to run off into water. After these processes, it is cast in sand, and in this state is called "blistered copper." It is now fit for what is called the refinery, and undergoes an operation called toughening. This is a delicate operation, and requires great skill and care on the part of the workmen. It is conducted in a furnace similar to the melting furnace, and the object is to thoroughly purify the metal from any portions of oxygen, which is performed by adding charcoal to the copper, while it is in fusion, and stirring it occasionally, till it is judged to be pure.

TIN.

This metal has also been known from the remotest ages. It is mentioned by Eleazar, the priest, in the book of Numbers, chapter 31st, verse 22d. All the other metals supposed to have been then known are enumerated in the same passage. This carries the knowledge and use of tin back 1500 years B. C. The Phœnicians used tin in the erection and decoration of the Temple of Soloman. Their brass was bronze; zinc had not then been discovered. We read of tin, also, having been got by the Carthaginian navigator, Himiles, from the Scilly Islands, which certainly present appearances of ancient excavations. Tin occurs, native, in two forms—as peroxide, and as sulphuret of tin and copper. The last is rare; the former constitutes the great source of tin, and is mixed with arsenic, copper, zinc, and tungsten. When occurring in rounded masses, grains, or sand in alluvial soil, it is called stream tin. The metal reduced from the tin ore forms block tin; that from the stream tin forms grain tin.

The greater part of the East Indian tin comes from Siam, Malacca and Banca. The Banca mines were discovered in 1711; in 1776 there were ten pits, which were worked by the Chinese for the King of Palimbang. One hundred and twenty-five pounds cost him only five rix dollars. The greater part went to Alinia, or was used in India.

The best ore of tin is found in Cornwall. It is commonly blasted out with gunpowder, and is procured in pieces of considerable size, which are stamped to powder by beams shod with iron. It is then washed until the earthy particles are carried off, and the tin is fit for the smelting house.

After being roasted in a reverberatory furnace, and again washed, it is a second time subjected to the furnace, being now mixed with small coal, and, in some cases, with a small quantity of lime. The smelted tin thus produced is placed in a small furnace and exposed to a gentle heat, when the purest portion melts first, and is drawn off. This is called "common grain tin." And the inferior, which still contains a small proportion of copper and arsenic, is then cast into pigs, called "block tin."

The purest tin is procured from the stream works of Cornwall, and affords from 65 to 75 per cent. of the best grain tin; its specific gravity is about 75; it melts at a temperature of 442°.

ZINC.

Zinc is a metal whose extensive range of application is only now beginning to be understood. It is found in the state of oxide and sulphuret; its specific gravity is about 7·7; its fusing point is 773°, but at a temperature of 300° it becomes extremely malleable, and may be rolled into thin leaves, or drawn into fine wire. One of its most valuable modern applications is as a protective covering for iron, being the best known substance for this purpose, The purifying of zinc may be effected by melting the impure metal with lead, in equal parts, in a deep iron pot, stirring them well together, skimming off the impurities as they rise, covering the surface with charcoal to prevent oxidation, and keeping them in a fused state for three hours. The lead descends to the bottom by its greater weight, and leaves the zinc above, to be drawn off by a pipe in the side of the melting pot.

LEAD.

Lead was also known to the ancients. Its specific gravity is 11·4, and it melts at a temperature of 612°. It is highly poisonous, and the greatest amount of caution ought to be observed in its application to domestic purposes, as, when in contact with water in open vessels, it quickly oxidizes, and small crystalline scales of oxide of lead are formed, a portion of which dissolves in the water, and is again precipitated in the form of a carbonate. If, however, the water contains a very slight amount of sulphuric acid, or a soluble sulphate, the corrosion is prevented.

ANTIMONY.

Antimony was discovered by Basil Valentine, a monk, in the fifteenth century. It is of a grayish white color, having a slight bluish shade, and very brilliant. Its texture is lamellated, and exhibits plates crossing each other in every direction. Its specific gravity is 6·702. It is sufficiently hard to scratch all the soft metals; it is very brittle, easily broken and pulverizable. It fuses at 810° Fahr.; it can be volatilized and burns in a strong heat. When perfectly fused and suffered to cool gradually, it crystallizes in octahedra. It unites with sulphur and phosphorus. It is soluble in alkaline sulphates. Nitric acid dissolves it cold; muriatic acid scarcely acts upon it. The oxygenated muriatic gas inflames it, and the liquid acid dissolves it with facility. Arsenic acid dissolves it by heat with difficulty. It unites by fusion with gold, and renders it pale and brittle. Platina, silver, lead, bismuth, nickel, copper, arsenic, iron, cobalt, tin and zinc unite with antimony by fusion, and form with it compounds more or less brittle. Mercury does not alloy with it easily. We are little acquainted with the action of alkalies upon it. Nitrate of potash is decomposed by it. It fulminates by percussion with oxygenated muriate of potash.

BISMUTH.

This metal occurs in its native state, and also in combination with sulphur, oxygen, silica and tellurium. The bismuth of commerce is almost exclusively obtained from Schneeberg, Saxony.

Commercial bismuth is never absolutely pure, but as the other metals with which it is associated are commonly more oxidizable than itself, it may, in a great degree, be separated from them by fusing the powdered alloy in an earthen crucible, with one-tenth part of its weight of nitrate of potash. When this mixture is heated until the nitrate is completely decomposed, a portion of the bismuth, together with the greater part of the impurities, will have been oxidized and remain in combination with the potash, while a button of purified bismuth remains in the bottom of the crucible.

Bismuth enters into the composition of the best type metal, and has the property of imparting to it a clean, sharp face. In the solder employed in the manufacture of pewter wares it also forms an ingredient. Bismuth forms one of the ingredients of a fusible metal, from which, as toys, spoons are made which melt on being put into a cup of hot tea or water. Another alloy has been used in making safety plugs for steam boilers, which, by melting at a certain temperature, are intended to permit the escape of steam and prevent explosion. A subnitrate of bismuth is used as a cosmetic. Bismuth is employed in the manufacture of porcelain, as an agent for fixing the gilding and for increasing the fusibility of fluxes, and neutralizing the colors which are often communicated by them. It is also used to some extent in medicine.

(To be continued.)

When water was introduced into Hanover, in order to protect the cast iron water pipes they were coated on the outside with the residue from the distillation of coal tar, known then as gudron. Thepipes were first heated, and this substance, also heated, was applied to the tubes with brushes. Recently some of these tubes that had been in use for twenty years were examined, and found to be in an excellent state of preservation.

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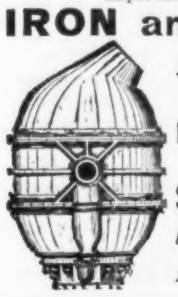
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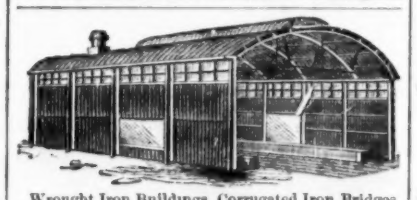
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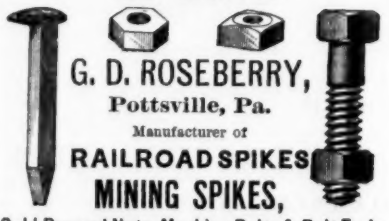
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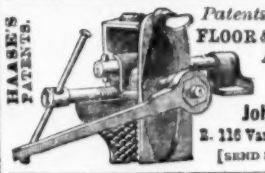

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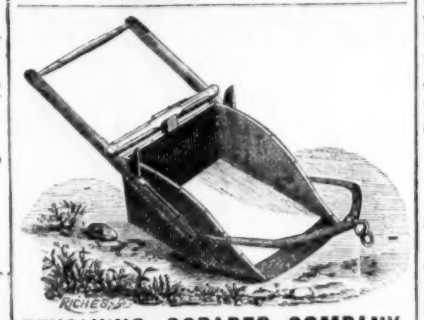

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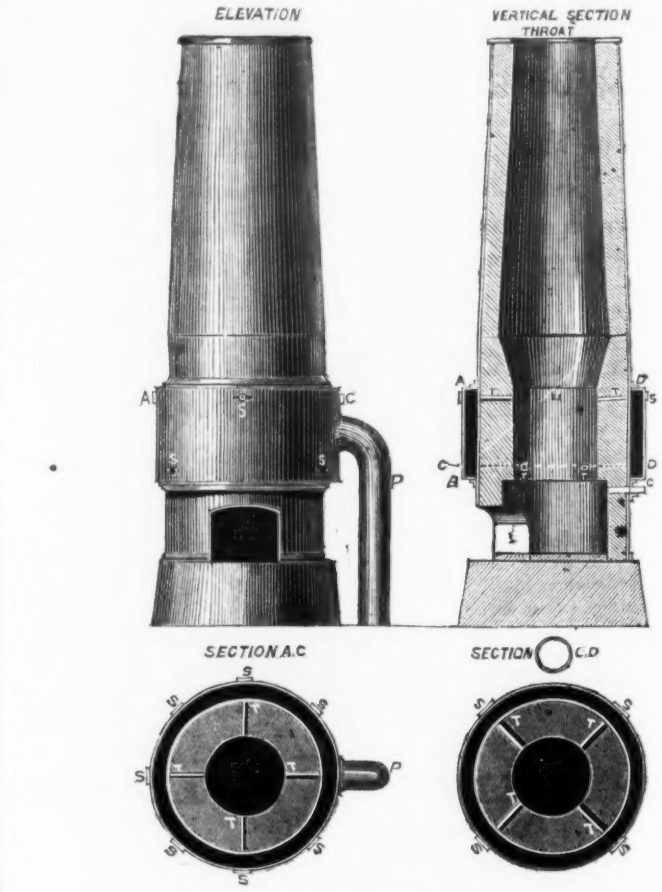
Improvement in Cupola Furnaces.

Voisin's flameless cupola, shown in perspective and section in the accompanying illustrations, promises some points of novelty and merit which entitle it to the favorable notice of founders. Economy of fuel is the object sought, and one of these cupolas lately erected in the foundry of Messrs. Mather & Platt is said to have effected a saving of 50 per cent. in the amount of coke consumed over any cupola previously used. The cost of altering a cupola according to this system is not great, and if anything like the saving mentioned can be secured, a real step in the economical consumption of fuel will have been made. The aim of the invention is to burn in the interior of the furnace, and at the very spot where they are formed, the combustible gases generated during the process of working, and hitherto allowed to burn to waste at the furnace top. For that purpose an additional supply of air is given at a proper hight through a set of tuyeres, the ordinary supply near the bottom not being interfered with. The same number of tuyeres are placed in the upper set as in the lower, and the two sets are connected by means of an annular air chamber, A, B, C, D, which can be formed either outside or inside the shell of the furnace.



VOISIN'S FLAMELESS CUPOLA.

The upper tuyeres have only half the sectional area of the lower ones, and both sets are always worked together. The following is the explanation of the chemical reactions which occur in cupola furnaces altered upon Voisin's system, as set forth by the inventor: The air forced through the bottom set of tuyeres T T, burns out the coke and generates carbonic acid, which is an incombustible gas. The considerable heat involved by the production of carbonic acid has caused the coke which lies over the bottom tuyeres to get red hot. In its way upward the carbonic acid, passing through layers of red hot coke, combines with a quantity of carbon equal to that it already contains, and is turned into carbonic oxide, which is a combustible gas, evolving when burning a large quantity of heat. Carbonic oxide, like every other combustible gas, requires the presence of air for combustion, or rather of the oxygen contained in atmospheric air. In ordinary cupolas the highly heated carbonic oxide which is discharged at the top there meets the requisite air for combustion and ignites, producing a considerable heat, which is completely wasted. The product generated by that combustion is again carbonic acid ($CO+O=CO_2$). It is then obvious that an additional supply of air given into the furnace at the very spot where carbonic oxide is formed, will cause this and other combustible gases which may have been produced to burn inside the cupola, so that the heat evolved during that combustion will be applied to the metal to be melted. This additional supply of air is given in Voisin's cupola furnaces through the upper set—T, T, T, T—of tuyeres. The result of this arrangement, by which hitherto wasted heat is made use of, is a considerable saving in fuel, a more rapid fusion, and the disappearance of flame at the furnace top, whence the name of "flameless cupola furnace." The upper set of tuyeres creates an additional zone of fusion, thereby accelerating the melting of the metal. In front of each tuyere there is placed in the belt a sight hole S, on which is fixed a frame containing a piece of colored glass, through which the action in the furnace can be observed at any time.

Making Iron With Natural Gas.

A correspondent of the Pittsburgh *Commercial* says:

Allow me, as a manufacturer deeply interested in the growth and improvement of this Iron City, to give yourself and readers a slight sketch of one of the most interesting innovations in the mode of making iron ever introduced. Hearing that a well-known firm of iron manufacturers, whose works are situate at Leechburg, on the West Penn Railroad, some thirty or forty miles hence, had applied natural gas as a substitute for coal as fuel, I took a run up to see the *modus operandi*. I found that the gas was procured from a well originally sunk for oil, but the parties who started it with that object had given it up with disgust, and it was simply a happy thought which suggested to the very practical Mr. Rogers the feasibility of utilizing the gas which was so wastefully roaring away, and by the aid of a few pipes he has had the gas conducted across a bridge into the rolling mill, and where it does duty from firing the boilers, puddling, heating, annealing, to lighting up the works, and with the happy result of a quicker and better yield and quality incomparably superior to iron worked with coal as fuel. I have no hesitation in saying this simple arrangement will completely revolutionize the manufacture of iron in future. The wonderful benefits to quality and yield, and the pecuniary advantages are so great and apparent that no one can compete, except at a loss, with "coal versus gas." A few years hence and all that district will be studded with mills, forges and furnaces. Already an arrangement has been made to sink other wells (one is being sunk now) and to locate works. The land owners, with creditable policy, have agreed to a certain royalty to the enterprising gentleman who has opened up this mine of wealth; and now it remains to be seen whether Pennsylvania (with the extraordinary advantages nature has given Tennessee and other States) will lie quiescent and allow the scepter of King Iron to slip from her grasp. This opportune discovery, which yields 33 per cent. extra quantity with the same machinery, and $10 to $20 per ton better price, gives to us a decided victory if followed up. The situation, too, is all that could be desired. Communication East, West, North and South is secured by the Pennsylvania Railroad running through the district, timber and coal are abundant, and it seems a natural center for the manufacture of iron. The saving alone at this work at Leechburg is upward of $700 per week; and it will be well for our manufacturers to look into this matter. Many have done so, and all, I believe, are impressed with the extraordinary advantages offered.

I take this opportunity of thanking Mr. Rogers for his frank courtesy and information, which, I understand, he extends to all visitors.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, May 18, 1874.

Concentrated dullness and vapid stupidity would be a fairly condensed homily in the condition of affairs in this city at this writing, and if the contents of this letter should come under the same category, it would not be surprising. So far as the iron trade is concerned things would seem to be about as bad as bad can be, and yet the initiated claim to scent the odor of coming activity in the air, and there are certainly some things going on *sub-rosa* which indicate that they are, perhaps, not far wrong. While the number of furnaces out and going out of blast appears to be constantly increasing—the surest means by the way to bring about the desired revival—others are quietly preparing for resumption of work. If the price of pig metal has not touched bottom, the best informed in the trade seem to think it has very nearly done so, and it is at least a hopeful sign to see the speculators in iron—the old hands who rarely buy amiss, leaving the stock market, and at last investigating the iron market. It is fashionable now in iron circles to believe that the bottom has dropped out of the business, and as people in an epidemic add to the number of deaths by the story of each new victim—to spread the disaster by continued and reiterated expressions of depression. And yet all the works are not idle, while the number of those that are only serves to hasten the time when all will be running again. You had a case in point in this last week, where one rolling mill firm of this ilk informed you their mill had not been idle for twenty years. The real trouble is and has been, that our iron trade had run too much to railroad supplies. Rail mills and car irons, tank iron and locomotive material were the sole end and aim of half the works, and with the smash in railroad building came a quietus to them. The sheet mills, the mills, and those others whose specialties were not all in one basket, like the great rail mills, have been fairly busy all the time, and are now. But if the people here believe we are going to the dogs our British cousins have immense faith in our recuperative energy, and are evincing their faith by their works. While the money articles of the papers, both sides the Atlantic, are impressing on their readers the utter impossibility of negotiating an American railway bond, I am personally cognizant of two new American railroad enterprises just floated upon the London market, and the proceeds of which bonds will be expended in this country under the direction of the lenders in the gradation and construction of these roads. Iron, rolling stock and every thing will be purchased and paid for here by the parties taking the bonds. Several other similar enterprises now in hand abroad are in process of similar completion, and John Bull, while he will lend us money, still proposes to see that we spend it properly, and for the purpose for which it was lent.

Nor are the investments of foreign capital in ore and coal lands by any means stopped, as many think. As a case in point, and to encourage our weak kneed brethren, I may say, without violating confidence, that the agent of a British company, who have made purchase of large amounts of iron lands in the Southwest, left this city for the locality of his purchase within a few days, to make the final payment of $350,000 on the property, and to receive title. This company proposes an expenditure of no less than £300,000 sterling in this property, the scheme including two blast furnaces, rolling mill, car wheel foundry, and, ultimately, a Bessemer works. Still more: another agent of an English syndicate, with a subscribed capital of £2,000,000, made in your city within the week the first purchase for his company. The avowed object of this syndicate is to purchase iron and coal lands in *four* states of the Union, thoroughly open and develop them, place them on the London market and colonize them. Two large iron works in the United States, now idle, but both of large capacity, are before English capitalists for purchase, with a fair prospect of an early sale. These things are all going on quietly, but, nevertheless, they are undoubted facts, and I merely mention them in order to show the disheartened that confidence in American investments is not shaken abroad either by the panic, inflation or the Council of Foreign Bondholders.

We are having a revival of Centennial feeling, also, and from present appearances I really believe the defeat of the Congressional appropriation was the best thing that has yet happened the Centennial. There is a quiet determination now that, under existing circumstances, Pennsylvania will play a "lone hand" in the Centennial game, and in euchre-istic parlance—no irreverend pun intended—will make "four times." The sympathy abroad for our Centennial is very strong, and our iron men must put their best foot foremost, for, if report be true, the English iron works, as well as Krupp, of Essen, and La Creuzot, mean to be strongly represented in the Exhibition. Possibly we may not have so grand a series of buildings, but the Phœnix people can get us up most anything to order out of iron and glass in a year, and if the rest of the Union don't wish to come to our show, the Pennsylvanians will at least maintain the honor of the country against foreign industry.

An important event in the much discussed subject of steam canal navigation transpired during the week at Reading. This, as announced by the Reading *Eagle*, was the arrival of the steam canal barge Orus, Capt. West, at that *port* from Staten Island, carrying the first regular freight ever brought to that city by steam canal navigation. The success of the Orus argues well for the practicability of the propulsion of steam boats carrying heavy freights on the Schuylkill canal. The Orus has now completed her first round trip, which the Captain reports as an entire success, in having made better time at *less cost* than could have been done with horse-power. The subject of cost is, after all, the important point, and it is gratifying to hear of this success. The Reading Railroad Company, always wide awake in their own interests, are and have been seriously considering the subject of steam canal navigation, and the success of the Orus will probably determine their decision. With steam-power practically applied in canals we have an addition to our facilities of transportation of incalculable value—in fact almost enough to satisfy the Grangers. But, practically applied on the Schuylkill and Delaware and Raritan Canals and to Lake Champlain *via* the Hudson, it means cheaper ores to our furnaces and cheaper coals to your manufacturers, or, in other words, an additional hold on the markets of the world.

This is the season of launches, and, not to be outdone by Chester, Wilmington followed last week by the launch of the Hudson from the yard of Pusey, Jones & Co. The Hudson is intended as a sister ship to the Knickerbocker, of the Cornwell line, the latter said to be the fastest steamer on the Atlantic Coast.

The Hudson is 280 feet in length on the load line; breadth, 34 feet; and depth, 26 feet. She is built in four water tight compartments, and the machinery and boilers are perfectly inclosed by iron partitions to guard against the danger of fire. She is about 2200 tons, old measurement, and probably 2000 by the registry rules. She will be fitted for both freight and passengers, having first-class state room accommodations for sixty of the latter. Her machinery is of the most approved construction for speed and economy of fuel.

The propeller wheel is fifteen feet in diameter and 22 feet pitch. It is constructed with the utmost care, the metal being manipulated in casting so as to secure the greatest tenacity, and the blades are fastened on in a new and improved manner. Their size and proportions being carefully adapted to the ship's dimensions, the best result as to speed may be expected upon this ship as upon the Knickerbocker. Great storage room for the cargo is secured between decks and in the hold, the state rooms, 30 in number, being all placed on the upper deck. The Hudson has been pushed forward to completion with remarkable dispatch, her first frame having been set up on December 24, 1873.

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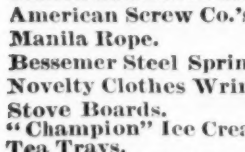

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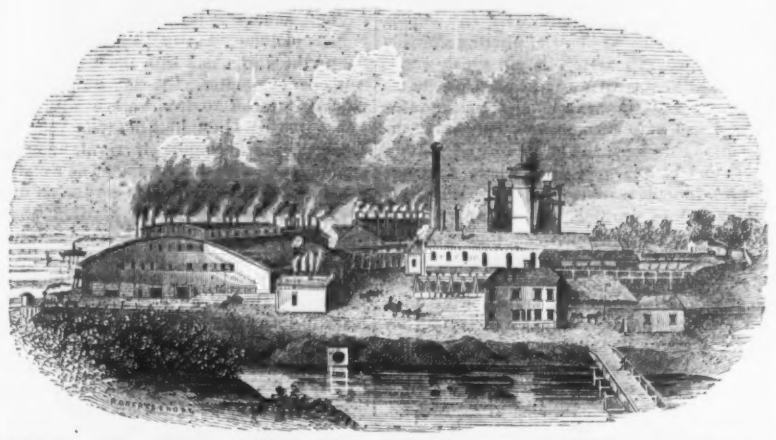

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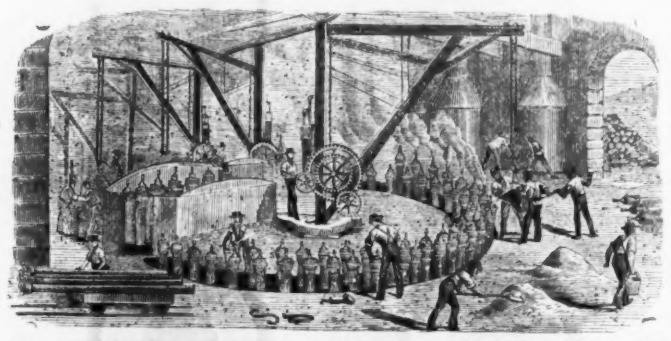

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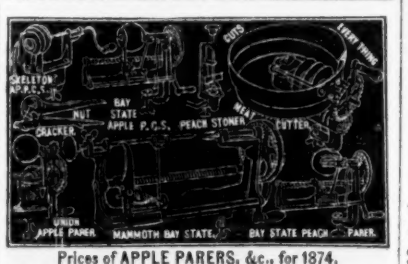

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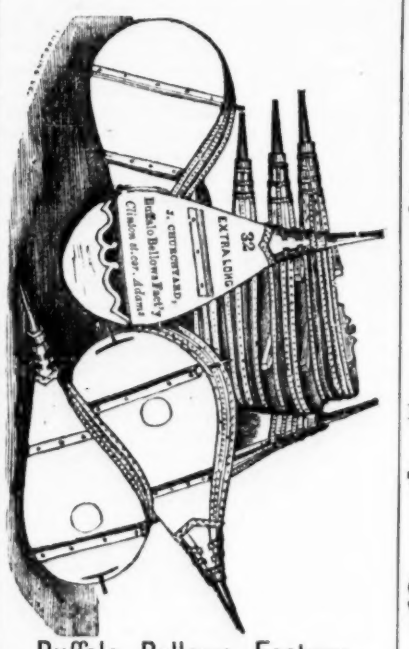

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CAST IRON FLANGE PIPES

Of any length or diameter, for Steam Engines, Exhaust Steam, Fire Purposes, Refineries, both Faced and Drilled and Plain. Also,

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Of all sizes, with necessary connections for same.

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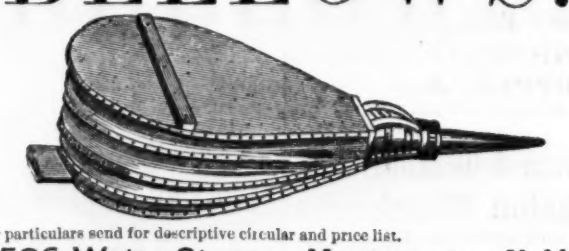

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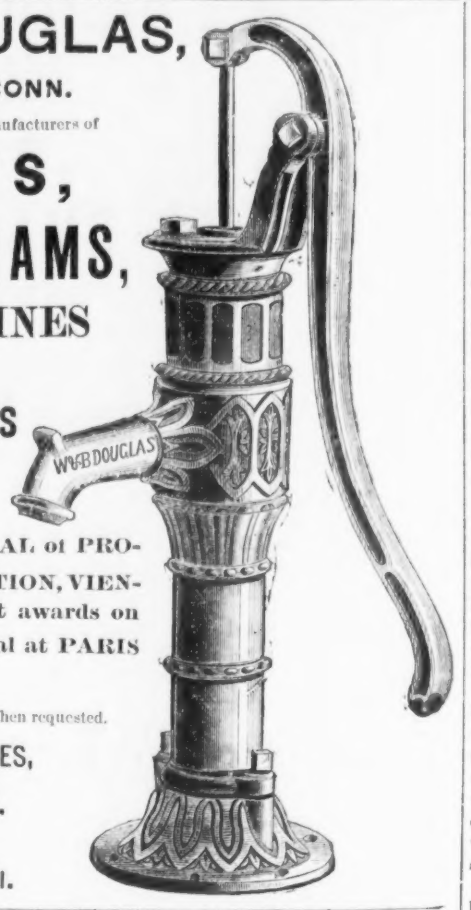

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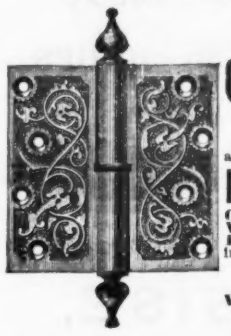

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Over 800 different styles

Pumps, Steam Pumps, Rotary Pumps, Centrifugal Pumps, Piston Pumps,

for Tanners, Paper Mills, Fire Purposes, suitable for all situations imaginable.

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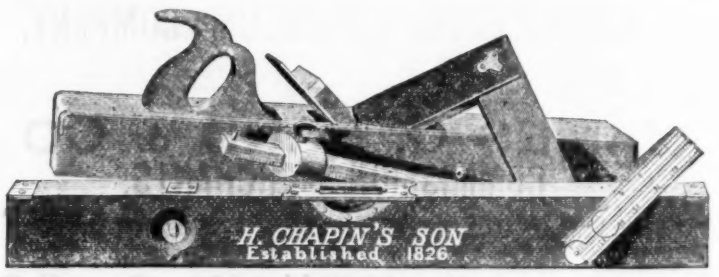

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New Patent "X" Razor Strap.

PATENTED DECEMBER 23, 1873.

This Strap, designated on our List as Letter "X," is of novel construction—is elastic, pleasantly yielding to the razor—gives a keen fine edge—is made of superior stock—is furnished at a low price—**and gives universal satisfaction.**

☞ ITS PRICE SELLS IT. ☜

BENJAMIN F. BADGER, Sole Manufacturer,

Badger Place, Charlestown, Mass.

The Iron Ores of Tennessee.

So far we have spoken of the dyestone as occuring in Tennessee; but it has a great range outside of the State. It extends southwestward through the northwest corner of Georgia far into Alabama, and is represented by several lines of outcrops. It is the Red Mountain ore of Alabama, and has yielded many hundred tons of iron in that State. To the northwest it extends into Virginia, and indeed through it, reaching into Eastern Pennsylvania, where it is extensively reduced in splendidly appointed furnaces. The layers of ore are attended with shales and thin sandstones, which, with the ore, make up the *Dyestone Group* or formation. This is a part of the Niagara geological series. The Dyestone Group is often associated, in the ridges, with two other formations, the *Black Shale* and *the Silicious Group*, both of which lie above it. The three make a *trio* of formations often met with.

Prior to the war there were in the Dyestone Belt five blast furnaces and fifteen bloomaries. The quality of the iron made was excellent. Soon after the end of the war attention again began to be directed to the dyestone beds, and it was not long before a new era in iron making was inaugurated in a portion of the belt, by the building of a superior furnace in Roane county at Rockwood.

At this place are now erected two furnaces, only one of which is in blast. The burning of the gas in the furnace heats the boilers and makes the steam. These furnaces were built under the superintendency of Gen. J. T. Wilder, whose communication to the Bureau of Agriculture, included in this chapter, will be read with increased interest as the wonderful resources of this iron belt are made known.

We have already said that the Dyestone Belt lies at the very base of the coal measures. Here, then, we have, sandwiched, coal, iron ore, limestone and sandstone, the latter suitable for hearths. This circumstance adds much to the interest of this region. Nothing is lacking to make it one of the most famous metallurgical centers in America but facilities for transportation, capital and enterprise.

In the Dyestone Belt are four furnaces now in operation or temporarily suspended, and two or three others in course of erection. Oakdale, stone coal, hot blast, has a capacity of 1200 tons per month; Rockwood, Nos. 1 and 2, both stone coal, hot blast furnaces, have capacities respectively of 750 and 1200 tons per month; and the Cumberland Gap Furnace, charcoal, cold blast, has a capacity of 105 tons per month. Crockett Furnace, in Claiborne county, will soon be put in blast. This has the same capacity as the one at Cumberland Gap. Two will soon be in blast in Chattanooga; one already completed, with a capital stock of $100,000, and the other under way, with a like amount of stock. These furnaces propose to work mixed ores from various points with stone coal. The capacity of each is thirty tons per day.

The following letter from Gen. Wilder, superintendent of Rockwood, to one of the commissioners of the Bureau of Agriculture, will be read with interest.

ROCKWOOD, TENN., March 10, 1873.

Mr. Tom Crutchfield, Commissioner of Agriculture, Tennessee:

DEAR SIR: Your favor, asking me to give you a general outline of the mineral resources of East Tennessee, is received. With diffidence I undertake the subject, knowing my inability to do it half justice, yet feeling anxious to assist in such manner as I may the early development of the vast mineral resources of this wonderful country.

East Tennessee is a high valley, with an elevation of 1000 feet above the sea, running northeast and southwest above two hundred and eighty miles from Chattanooga, on the southern line of the State, to Bristol, at the northeastern end, the line of Virginia, with an average width of sixty miles. It is bounded on the southeastern side by the lofty chain of the Unaka range of mountains, reaching sometimes an elevation of over 6000 feet above the sea, with frequent gaps, through which numerous rivers flow to the northwest. Still further to the southeast, about fifty miles in North Carolina, is the unbroken chain of the Blue Ridge, over six thousand feet high. On the northwestern side of the valley is the level topped Cumberland mountain plateau, sixty miles wide, with its southeastern side next to the valley of East Tennessee. For a distance of 130 miles from Sale Creek (thirty miles above Chattanooga) to Cumberland Gap it is tilted up or folded back against the horizontally stratified Cumberland mountains. This uplifted edge is called Walden's Ridge, and is the southeastern limit of the great Apalachian coal field which runs entirely across the State, from northeast to southwest, with an elevation of 2000 feet, and an average of sixty miles wide by one hundred long, making a coal field of nearly 6000 square miles, or 3,840,000 acres; exceeding by 454,000 acres the entire coal area of Great Britain, including England Scotland, Wales and Ireland.

The Valley of East Tennessee is corrugated throughout its entire length with a number of low ridges running parallel to each other N. E. and S. W. with the valley. The rivers from the valley of Western North Carolina, at the base of the Blue Ridge, cut through the Unaka chain, and through the numberless ridges of the valley, until they unite in the Tennessee River, at the base of the Cumberland coal field, following which to the southern limit of the State at Chattanooga, the last named river suddenly turns its course and hews its way through the Cumberland chain to the northwest. Here, in the heart of the great Valley of the Mississippi, it offers its clear, deep current to bear the commerce of 15,000 miles of navigable waters, back through 800 miles of cotton and corn fields, through five great States, to its mountains of coal and iron, veins of copper, placers of gold and hills of marble, in a climate like Northern Italy; adding with its branches 1800 other miles of navigable waters to the wonderful net work of great rivers that form the national highways for the products of more than half the States of this Union, and bearing a tonnage greater than that of any nation of Europe.

This wonderful Valley of East Tennessee is lowest near the base of the Cumberland mountain, containing the coal fields on its northwest side. All its streams head in North Carolina and Western Virginia, and drain northwest into the Tennessee, each river forming a natural highway down stream to the coal fields. Nearly every ridge in the valley contains minerals of some kind, the cuts through which the rivers flow forming natural openings to the veins of iron ore, which outcrop in nearly every ridge, whilst the great Alleghany chain is ribbed and seamed with veins of iron ore of nearly every known variety. From the same range are taken large quantities of copper at Ducktown, whilst all along its northern base runs a great, broad belt of roofing slate and most beautiful black marble intersected with snow white veins. Along the base of the Cumberland range, runs entirely through the State, a low range or ridge of about 200 feet altitude above drainage, containing invariably two veins of red fossiliferous iron ore, varying in thickness from three to ten feet, cropping out through the crest of the ridge on its southern slope, and dipping at an angle of about forty-five degrees to the northwest. It is supposed to extend under the coal field; at all events, it crops out at precisely the same geological horizon on the opposite side of Walden's Ridge, in Sequatchie Valley and in Elk Valley, opposite Knoxville, localities 100 miles apart, and each ten miles from the place of disappearance of the ore at the southeast base of the mountain. The coal in Walden's Ridge is a dry, semi-bituminous, or rather semi-anthracite, working raw in the blast furnace, and requiring at Rockwood about two and three-fourths of a ton of coal to smelt one ton of pig metal. The ore averages a yield of sixty per cent. of iron, and the sub-carboniferous limestones furnish ample and excellent fluxing material, requiring twenty to twenty-five per cent. of flux. Nowhere along this long line of 160 miles is it more than half a mile from the iron ore to the coal beds, while the massive limestones are invariably between them the entire distance. The coal at Rockwood is very much disturbed, varying from one to over one hundred feet in thickness. Our No. 1 furnace has been in blast most of the time for over four years, making a fine quality of pig iron for rails with only one kind of ore. No. 2 furnace, of forty tons capacity, will be put to work early in the spring, when we will turn out, with both furnaces seventy-five tons of pig iron per day. At the base of the Unaka chain, on the south side of the valley, is a wide chain of high knobs, in many of which are wonderful beds of the finest brown hematite iron ore, some of which contain maganese. In the Unaka chain are inexhaustible veins of brown hematite, and in the high mountains of the Blue Ridge are large veins and lodes of magnetic iron ores. All these must go with the rivers to the coal fields on the northwest side of the great valley, for this reason—that it requires one ton and a half of good iron ore to make one ton of pig iron, and it takes about three tons of coal to reduce it, and three to four more tons of coal to convert and finish it into bar iron; thus using seven tons of coal to produce one ton of merchantable iron, and one-third of a ton of limestone, making in all seven tons and a half of fuel and flux. These are found contiguous to large and persistent beds of iron ore, only requiring a mixture of one-half of the brown hematite and magnetic ores to make a merchantable iron, fit for any use in arts and commerce, and giving the advantage to manufacturers located near the coal in proportion to the greater tonnage of fuel and flux used, to the vastly lesser weights and freight of ores required to produce one ton of iron; in other words, saving in the production of pig iron one-half the transportation, and in bar or plate iron or nails, nearly 500 per cent. This is the advantage enjoyed by the manufacturers on the northwest side of the valley over those located on the southeast side, where is plenty of ores and no coal. Thus is insured to the northwest side of the valley, along the proposed route of the Cincinnati Southern Railroad, a continuous line of works and a dense producing population. A few words might be added, giving a geological outline of a cross section of this valley and its mountains on either side. Commencing in North Carolina, with the range of the Blue Ridge, an enormous eozoic upheaval ribbed with iron ores; thence northwest crossing granite formations to the metamorphic rocks of the Smoky or Unaka chain, walling long veins of copper and iron ores; thence through great beds of roofing slate, across the silurian ridges of the broad valley, to the single lines of Devonian shales at the base of the Cumberland. In the steep wall of this mountain you cross three workable veins of finest coal, cropping out above drainage, and reach the level top of the coal fields, having in less than 100 miles passed from the lowest primitive rocks across the Metamorphic, Silurian, Devonian and Carboniferous formations. These turned up on edge show all the wonderful provisions of nature in minerals, ready for the hand of man, deposited and hidden in the past ages, but unsealed and opened by the Creator's engineers and contractors—the earthquakes of the past and rivers of the present—and asking in mute eloquence for the mind and hand of man to take from their abundance and make them useful. These ranges and valleys are in a climate unequaled in salubrity and average comfort of temperature—the driving storms of the great plains of the Northwest being shut off by the continuous chain of the Cumberland mountain, and the raging gales of the Atlantic seaboard stopped short of our valleys by the range of the Blue Ridge and Unakas. These causes render this high mountain-walled valley not only more temperate in winter, but much cooler in summer than any valley south of the great lakes or east of the Pacific coast, and free from malaria, while the great number of medicinal springs of almost every known property or variety, makes our valleys a favorite resort for persons seeking either health of pleasure.

I have written these disjointed papers in a great hurry, being unable either to copy or correct, and send them as crude ores to be refined by workers in words, hoping they may direct more capable persons to call just attention to our enormous resources, I having, pioneer-like, but "blazed out" the road.

I am earnestly yours,

J. T. WILDER.

Appended please find a copy from our books of the workings of our furnace for the past two months:

MONTHLY REPORT OF ROCKWOOD FURNACE FOR THE MONTH ENDING SATURDAY, DEC. 26, 1872.

Material, etc.	No. pounds.	
Ore charged	2,144,000	$2,835 86
Coke "	891,200	2,005 20
Coal "	1,339,200	1,101 80
Limestone	552,700	304 59
Labor	....	1,170 15
Salaries	....	400 00
Material from Store	....	303 37
Blacksmithing	....	118 56
Foundry Castings	....	98 04
Total	....	$8,337 55

Produce, 590 tons No. 1 mill iron; cost, $14·13 per ton. Ore yielding 62 40-100 per cent.

REPORT OF ROCKWOOD FURNACE FOR THE MONTH ENDING SATURDAY, JANUARY —, 1873.

Material, etc.	No. Pounds.	
Ore charged	2,145,500	$3,194 80
Coke	1,408,800	3,169 80
Coal charged	1,636,600	1,405 77
Limestone	601,800	331 61
Labor	....	1,486 10
Salaries	....	580 00
Materials from store	....	127 95
Blacksmithing	....	68 15
Foundry castings	....	98 03
Total	....	$10,433 38

Product, 655 tons No. 1 mill iron; cost, $15·92 per ton. Ore yielding 62 78-100 per cent.

W. F. SANKS—for D. E. REES, Agent.

J. T. WILDER, Superintendent.

REMARKS.

Ores are charged at $3 per ton, and actually cost by contract $2 per ton. All allowances are made to cover any possible waste or cost of extra handling.

The cost for January is unusual, owing to the greater amount of coke used in that month, to reduce the amount of stock of coke on hand. Ore yielded for the time quoted above 62 59-100, and an average of 2·715 tons of coal used for each ton of iron produced.

J. T. WILDER.

We may add here that the heaviest collection of ores which were seen at the Vienna Exhibition, in 1873, came from Tennessee, and was under the charge of Gen. Wilder. The collection was honored with a premium, though it arrived very late.

A LIST OF FURNACES IN EAST TENNESSEE, WITH THE KINDS OF FUEL AND ORE USED, AND THE AVERAGE YIELD PER MONTH.

Showing a monthly yield of 3451 tons per month.

County.	Name of Furnace.	Fuel.	Blast.	Kind of Ore.	Average yield per month.	Remarks.
Roane,	Rockwood, No. 1,	Coke & Coal,	Hot.	Red Hematite.	576	In blast.
"	Rockwood, No. 2,	"	"	"	900	Blown out for repairs.
"	Oakdale,	"	"	"	900	In blast.
Claiborne,	Cumb. Gap Fur.	Charcoal.	Cold.	"	105	"
Greene,	N. Y. E. T. Co.	"	"	Brown Hematite.	200	"
"	Unaka,	"	"	"	300	"
Washington,	Brull's,	"	"	"	900	"
Johnson,	Bushnong,	"	"	"	100	"
Carter,	Knoxville Cor Co.	"	"	"	900	"
"	"	"	"	"	300	"
"	"	"	"	"	200	"
"	"	"	"	"	150	"
"	"	"	"	"	900	"
"	"	"	"	"	900	"

These furnaces have seldom been run to their full capacity.

A company called the Rhea Iron Company, will erect during the present year, in Rhea county, twelve miles below Rockwood, a furnace with a capacity of thirty tons per day. It is understood that this company has 5000 acres of fine coal and mineral lands. The name of the place is Greenwood.

[To be continued].

Underground London.—Underground the city of London is certainly the most wonderful in the world. It is a labyrinth of drain pipes, water pipes, gas pipes and underground railways. There are points in the soil of London where it would be extremely difficult to find room for another pipe. One company alone—the Gas Light and Coke Company—supplies two districts with nearly 400 miles of pipes, varying in diameter from three inches to four feet. These are the main pipes merely, and from them every house and street lamp receives on an average six or eight feet of small piping. In addition to these and the underground telegraph wires there are no less than 2500 miles of drain pipes of various dimensions. Less familiar to us, but no less important, are the lead and iron tubes—leaden pipes with outer castings of iron—along which written messages, packed in little felt and gutta percha cases, are blown from station to station. The convenience of these messages is immense. A steam engine forces in a blast of air, and in about a minute it travels a distance of 980 yards. There are at present 13 stations on the underground railway, and as the people walk upon the streets of London, electricity is flashing messages above their heads, and little missives are whizzing and darting just under their feet. As many as 1500 messages pass to and fro in a day. The drainage system of London presents a system of underground streets some two or three thousand miles in extent. All the drains empty into three great sewers running parallel with the Thames, which sewers connect in the neighborhood of Victoria Park, and through Barking Creek discharge into the river. Men are constantly employed keeping these drains in repair. Londoners never pour a pail of water down a drain but at the depths of that mysterious aperture somebody is making way for it. A stranger, properly customed, can explore these depths, which resemble vaulted galleries, in the sides of which are traps forming various small channels. When the storm waters come, as they sometimes do during a thunder storm, the torrent is fearful—so much so that upon several occasions men have lost their lives.

Launch of a New Iron Ship at Wilmington.—The iron screw steamer, built at Wilmington, Del., by Pusey Jones & Co., for the Cromwell line, to ply between New York and New Orleans, was launched on the morning of the 14th instant with entire success. Her capacity is about 2000 tons, new registry; her length, 300 feet; breadth of beam, 34 feet; depth 26 feet. She will be fitted with direct acting engines of improved construction, which engineers here regard as every way better than the much vaunted compound arrangement. The great speed of the ship Knickerbocker, completed for the same line by the same builders last December, is regarded as settling the question that compound engines are needlessly cumbrous and complicated, costing double in the first place, and in the same ratio for repairs. The new ship is expected to quite equal her consort in speed. She will accommodate sixty first-class passengers, and will be rapidly completed. The builders of this ship have, within twenty years, launched sixty-one iron steamers.

THE NICHOLSON FILE.

All Nicholson Files are cut with the Patent *Increment Cut*, an invention owned and controled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly *expanding or increasing in size and space from the point*, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at east) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will *not* be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformityof machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements on the old methods.

The "*Increment File*" is not an experiment, but an established fact, and already has acquired a legitimate demand for upwards of 500 dozen per day. We employ no *regular Travelers*, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

Prices and terms will be forwarded on application to

NICHOLSON FILE COMPANY,
Providence, R. I.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,

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P. S. STUBS' FILES, TOOLS & STEEL,

Turner Files, - -	$5 00 to £	Stubs' Files & Tools, -	$8 00 to £
Turner Rasps, - -	5 50 to £	Stubs' Bright Steel, -	7 00 to £

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Black Diamond File Works.

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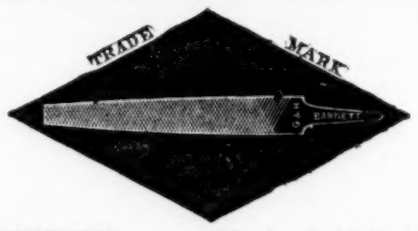

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G. & H. BARNETT. 39 41 & 43 Richmond St. Phila.

FILES AND RASPS.

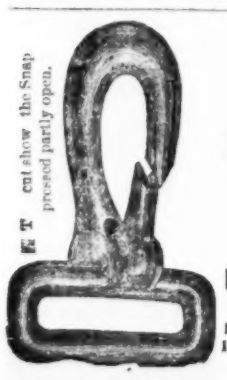
XTRA QUALITY,

MADE FROM THE BEST

IMPORTED STEEL,

BY THE

Auburn File Works,
AUBURN, N. Y.



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MIDDLETOWN, CONN.,

MANUFACTURERS OF

The Celebrated "Baldwin" Plane Iron,

HENSHAW'S PATENT HARNESS SNAPS

GERMAN HARNESS SNAPS,

PAT. GAFF TOP-SAIL SELF-MOUSING SHIP HOOKS

Plow, Fillettster & Dado Stops of all kinds, Set Screws for Plows, Bench Plane Starts, &c. Patent Washer Cutters, Plane Iron Screws to order of any size.

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Manufacturer of the **BEST**

Ice Cream Freezer

IN THE UNITED STATES.

Every one warranted to give satisfaction, or no sale.

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432 Market Street, Philadelphia,
Or **109 Sycamore Street, Cincinnati.**

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48 Warren St., N. Y.

SASH CHAIN.

THE BEST & CHEAPEST MADE.

Manufacturers of every description of

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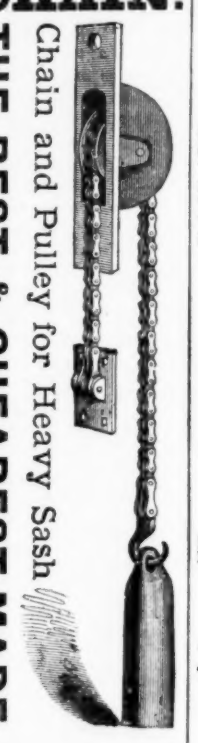
Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,

Agents for Gautier's Black Lead Crucibles.

Agency and Depot of the TRENTON LOCK COMPANY.

Chain and Pulley for Heavy Sash



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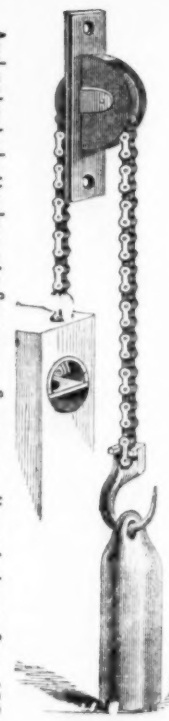
And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842.



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Coopers' & Turpentine Tools.

Coopers' Drawing Knives,	Turpentine Hackers,
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Stocked Croze and Irons,	Turpentine Axes,
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Reading Hardware Co.	Barnes & Deitz.	Underhill Edge Tool Co.
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Hardware and Upholsterers' Brass Goods.

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Manufacturers of Judds', Prindle's and Combination Patent Curtain Fixtures, Locks and Curtis Patent Raisin Seeder, Patent Twine Boxes, Picture Nails and Hooks, Escutcheon Pins, Coat and Hat Hooks; also Miscellaneous Iron and Brass Goods.

Small Brass and Iron Castings made to order.
64 Duane Street, NEW YORK.

To all Manufacturers who use Emery for polishing Iron and Steel Goods, and for the manufacture of Polishing and Cutting Wheels, and other purposes.

CORUNDUM

FROM THE

UNIONVILLE MINE, Chester County, Pa.,

Manufactured by the

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Are now prepared to furnish a *very superior quality of Genuine Corundum*, from the *Unionville Mine, Chester County, Pa.*, which is the largest known deposit of Corundum in the world. It is harder than Emery or any other known Mineral except the "*Diamond*," and superior in its cutting qualities for the polishing or cutting of steel, iron or other hard substances for which Emery has been used.

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Coes & Taft's Pat. Wrenches.	Mouse Traps. Wire Selves.	Yaw's Cow Bells.
Axe, Pick, Sledge & Hammer Handles.	Scale Beams.	Axes, Picks and Hatchets'
Hatchet, Auger, Chisel & File Handles.	Patent Tap Borers.	Hammers. Crow Bars.
Mallets. Pat. Boot Jacks.	Tool Chests.	Sad Irons.
Gimlets and Gimlet Bits.	Climax Horse Collars.	Boring Machines.
Augers and Auger Bits.	Brundage Horse Nails.	Cast Iron Hatchets
Cocos Nut Dippers.	Maguire's Wr't Iron Goods.	Coffee Mills.
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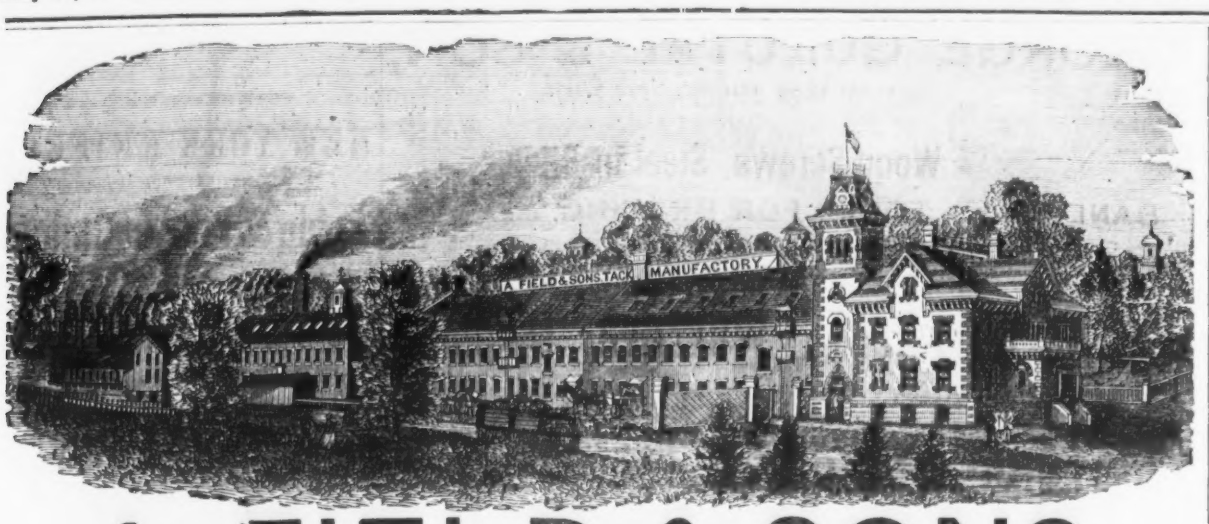
Adams & Chute, 19 Oliver St., Boston.	F. H. Davidson, 158 Franklin St., Baltimore.



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TAUNTON, MASS., Manufacturers of

Copper and Iron Tacks, Tinned Tacks,

SUPERIOR SWEDES IRON TACKS. for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

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Zinc and teel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Paten' Brads, Finishing Nails, = Annealed Trunk and Clout Nails, Hob and Hungarian Nails,

Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails
Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, etc., etc.

OFFICES AND FACTORIES AT TAUNTON, MASS.

WAREHOUSE AT 35 CHAMBERS STREET, NEW YORK, where may be found a full assortment of Tacks, Brads, &c. for the accommodation of the New York Wholesale and Jobbing Trade.

☞ Any variations from the regular size or shape of the above named goods made from samples, to order.

Washoe Tool Mfg. Co.,

Manufacturers of he

Celebrated Washoe Railroad and Mining Picks,

MATTOCKS, HATCHETS AND OTHER ADZE EYE TOOLS.

AMERICAN INSTITUTE NEW-YORK.

Having doubled their Manufacturing facilities, they can now fill orders promptly.

All orders should be addressed to their

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Where Catalogues and Discounts can be had on application.

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CHARLES CHURCHILL & CO.,

American Merchants & Importers of Machinery & Tools,

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To AMERICAN MANUFACTURERS we offer our services for the introduction, in Great Britain and the Continent, of MACHINERY and TOOLS of improved construction. It is now seven years since we established ourselves in London, and during that time we have succeeded in establishing a demand which is now rapidly increasing, thus proving the value of these goods throughout Great Britain and the Continent. We are now the European Agents for several leadin American Tool Makers, to whom we will give reference on application to either our London or New York house.

We invite all makers of improved Machinery and Tools to communicate with us, sending us catalogues and price lists. We shall be pleased to take up and introduce all such goods suitable to this market. Having successfully introduced American Vises, Chucks, Drills, Drilling Machines, Pumps, and a variety of other tools and household utensils, we are confident all good and useful articles will meet with success.

We are European Agents for *The Iron Age*, to whom refefence may be made.

AMERICAN MANUFACTURERS receiving orders from abroad can communicate with our New York house and execute the orders through us, thus avoiding all risks C. CHURCHILL & Co. also offer their services to all purchasers of Machinery and Tools in Great Britain and Europe who may require special goods, for which quotations will be given on application A *Stock* of Tools and Machinery are kept in our London Warehouse for immediate delivery.

Catalogues and Price Lists sent post free on applicatio.

JOHN MAXHEIMER,

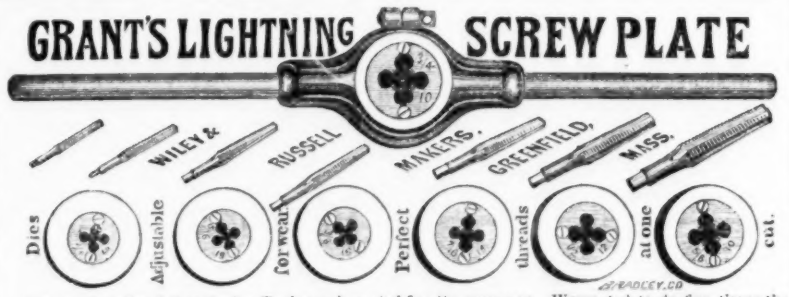
Manufacturer of

JAPANNED and PATENT EUREKA Bright Metal

BIRD CAGES.

Nos. 247 & 249 Pearl Street NEW YORK.

GRANT'S LIGHTNING SCREW PLATE



The most perfect Labor Saving Tool ever invented for its purposes. Warranted to do five times the work possible with any other screw plate. Also *HAND BOLT CUTTING MACHINES,* ranging in price from $60 to $300. *POWER BOLT CUTTERS,* from $175 to $350.

FINE FRICTION CLUTCHES.

WILEY & RUSSELL, Greenfield, Mass.

EAGLE IRON FOUNDRY.

DEMAREST, JOYCE & CO.,

Iron Founders,

MACHINISTS,

and Manufacturers of

Sewing Machines, Steam Fittings,

AND

LIGHT WORK of all kinds.

ALSO

Plain and Ornamental Japanning.

20 to 30 Morton, and 57 to 65 Clymer Streets,

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EAGLE IRON FOUNDRY.

Something New for

OTIS FURNACES & MINES.

New Union Steam Safety Elevator,

How One Works.

RIVERSIDE IRON WORKS, DEWEY, VANCE & CO., Wheeling, W. Va., January 14th, 1873.

Messrs. OTIS BROTHERS & Co., New York.

Dear Sirs: The experience of a year proves that ***your Furnace Elevator is superior to all others in use.*** We have in the six weeks from December 1st to Sunday last, 12th inst., made ***2724 tons, 1401 lbs. Pig Metal,*** or an average of near ***65 tons per day,*** which required the elevator to ***lift 72 feet high*** 4½ tons Ore, Coke and Limestone for each ton of metal produced, or ***more than 11,500 tons material in the 6 weeks.*** The largest yield in ***one*** day was ***81 1-4 tons*** Iron, involving the lifting of ***345 tons*** material ***in 24 hours.*** This has all been done to ***our satisfaction,*** and that, too, in the ***coldest weather we have had.*** Other furnaces with ***water*** and ***pneumatic hoists*** have experienced ***great difficulty,*** on account of the ***water freezing*** in the ***tanks;*** and in the case of the ***air*** hoists, we understand that two furnaces, not far from us, ***had*** to ***"blow out."*** from being ***unable to hoist stock*** during the ***"cold snap."*** The difficulty, we are told, was caused by the ***condensed moisture*** in the ***blast freezing to the sides of the cylinders,*** so that the ***piston could not move*** up or down.

Very truly, yours, DEWEY, VANCE & Co.

for Circular to

OTIS BROTHERS & CO.

348 Broadway, NEW YORK.

BUSINESS ITEMS.

NEW JERSEY.

The Watson Manufacturing Company have paid a royalty to Mr. Charles Ball, of Ridgewood, for a patent truck for lifting and transporting bar iron, locomotive and car axles, shafting, etc. Messrs. Danforth, Cook & Co. are also building one of the trucks.

PENNSYLVANIA.

The Lackawanna Iron and Coal Company, of Scranton, suspended work on Saturday night at all their puddling furnaces, rolling mills and mines, throwing out about 1700 men. The cause is the continued depression in the iron market. The company's yards are crowded with thousands of tons of rails and other products of their works for which they cannot find sale.

Donaghmore Furnace, Lebanon, is to be blown out for repairs.

The machinery for a large paper mill on the Monongahela River, that of the Spring Mills Paper Company, located six miles from Monongahela City, is being built at Philadelphia by Nelson Gavit. It consists of a Fourdrinier machine, rotary boilers, three rag engines, &c. The mill is a new establishment, designed to make flour sack paper.

The Wistar Coal and Iron Company is developing extensive mines of coal and iron on the West Branch, Clinton county. A blast furnace, rolling mill, coke ovens, inclined plane, &c., are all in progress of construction.

The Harrisburg Car Manufacturing Company has resolved to suspend operations until there are substantial evidences of a revival of business.

The sheet mill of Seyfert, McManus & Co., in Reading, resumed operations on the 4th inst.

The Shenango Nail Factory, New Castle, started again last week.

The Tamaqua Iron Works are 200 feet wide by 1100 feet in length, employ 104 hands, and have orders on hand to last for three months.

The rail mill of Harbaugh, Mathias & Owens, Pittsburgh, which has a capacity of 1000 tons per week, was "laid off" a few days ago from lack of orders, and it is uncertain when operations will be resumed.

The furnace at Emaus is in blast, and the new furnace at Millerstown will be ready for blowing in in about three weeks. The new furnace at Topton is not yet in blast, but can be got ready whenever desirable. At Lyons work has been commenced at a new furnace, but is not carried on with very great energy. The furnace at Kutztown is being completed as fast as the weather will allow.

The Pottstown Iron Company was organized in 1866. They own two furnaces, a nail and boiler plate mill. The annual production of nails is from 100,000 to 120,000 kegs (53 machines), and of boiler plate 6000. About 400 hands are employed. During the dullness of the past few months they have been running full time and force.

The Union Works, Danville, have one furnace only in blast, making 16 tons per day and employing 24 hands.

VERMONT.

The Fairbanks Scale Company, of St. Johnsbury, recently had an order from the Baltimore and Ohio Railroad Co. for 24 500-bushel hopper scales to be put into their immense elevator building at Locust Point. As these are 15-ton scales, and are all set in a row, some idea of the size of the elevator may be gained.

MASSACHUSETTS.

The Globe Nail Company, of Boston Highlands, has been making improvements in the manufacture of its pointed, polished and finished horse shoe nails, and is now cutting up the best Swedish and Norway irons at the rate of 1000 tons a year.

The car and general repair shops of the New York and New England Railroad Company, at Readeville, were burned May 14th. Loss, $40,000.

CONNECTICUT.

The Billings & Spencer Manufacturing Co., of Hartford, are manufacturing large quantities of dies for the Prussian government, to be used in the manufacture of the celebrated needle gun in Prussia. About thirty tons of steel have been used by them in the manufacture of these dies.

The Birmingham Iron Works have just concluded a contract with the Union Pacific Railroad for the construction of rolling mills to be erected west of the Rocky Mountains, where the railroad company own the iron ore, coal and timber.

Tariffville is to have a very extensive screw factory, with a capital of $500,000. The superintendent is to be M. B. Clark, of the Ames Works, at Chicopee, Mass.

Large invoices of machinery, consisting principally of machinery for the manufacture of the needle gun, are being constantly shipped by the Pratt & Whitney Company, of Hartford, to the Prussian government, under a contract made by that government with the above mentioned company.

The Southington Cutlery Company are building extensive additions to their works.

The Union Metallic Cartridge Company, at Bridgeport, have commenced the shipment of 300 tons of cartridges to St. Petersburg for the Russian government.

The Hartford Axle Works Company, of Norwalk, has more orders than it can fill, and is putting in a new hammer, and otherwise preparing to extend its business.

OHIO.

The new blast furnace of the Ironton Iron and Steel Company, nearly completed, will be appropriately named "Ironton."

Bowler, Maher & Brayton, Cleveland founders, are running a full force of men, but their establishment is not taxed to its full capacity. Business, however, is quite satisfactory, and as good for the season as at any corresponding period in the past three years, while the tendency is in the direction of improvement.

The Bourne & Knowles Nut and Washer Factory, Cleveland, has been running full time during the season, but not up to capacity, orders having been rather light. The condition is improving, though slowly.

MICHIGAN.

The Wyandotte Rolling Mills have closed a contract for 600 tons thirty-pound rails, with the Denver and Rio Grand Railroad Company. The terms are cash on delivery at Chicago. the rails give satisfaction, the order will be increased to 6000 tons.

The iron furnace at Leelanaw is running thirty tons pig iron a day.

The Champion Iron Company, Marquette, is working a force of about two hundred men at the present time, and mining operations are going on satisfactorily.

The Marquette *Mining Journal* says: It is not likely that the Morgan Iron Company will rebuild this season their furnace destroyed by fire at Champion lately. The condition of iron matters does not seem to call for any increase in the number of furnaces in the district for the present. We presume, however, as the stack and a portion of the machinery are still good, they will be utilized at a future period.

The Menominee Furnace started up last week, and made the first cast on Saturday. She is said to be in good trim for a long run, and her product for the season is sold ahead.

The Beecher Furnace, in this city, is receiving a new hearth, and having general repairs. It will be ready for business in the course of three or four weeks.

American Iron Shipbuilding.

We take the following from the Philadelphia *North American*:

The doubts of our ability to rebuild our maritime supremacy are fruit from European teaching. When the close of the rebellion called for more shipping, which, owing to maritime changes, must be of iron, we had neither the appliances nor the skill for satisfying it. But in so short a period much has been done to remedy the incapacity. In the last two years twenty-eight iron steamships, aggregating 63,500 tons, have been built on the Delaware; of which 38,000 tons are for the foreign trade. The Clyde-built Australian steamship cost $520,800, currency, there: the Delaware Atlantic steamships, 250 tons larger, cost $520,000 each, and the Pacific Mail steamships, of the same tonnage as the Australian, cost $40,000 less than the latter. The Pacific steamships now being built, of 5250 tons, cost $1,025,000, and of these and all it is remarked "that ocean-going iron steamers of any class, ton for ton, quality for quality, can be built at as low a cost this day on the Delaware as on the Clyde, and the advantage in all respects is likely to turn more and more in our favor as time goes by." This is a terrible fact in the minds of our European friends, but beyond all doubt we are rapidly returning to our true position, and preparing to contest with them once more the kingdom of the seas. For England especially, the conditions under which she has hitherto been enabled to obtain so easy and complete a triumph are no longer the same, nor by many degrees so favorable at home or abroad. The very upward movement of the human race is against her, since a superiority which was based upon the helpless degradation of human labor, and the market cheapness of human life, is out of joint with the age.

There are now fifteen foreign steamship lines running to New York, with 170 vessels of 550,000 tons. They are a unit against American efforts, and bolster the free ship law that would give our commerce permanently to them. But their and all opposition to the restoration of our maritime interests will fail unless there is some substantial deficiency on our part. This is not in localities suitable for such erection. There are one hundred miles of river front between Philadelphia and the Breakwater, where the average width of the stream is two miles and the depth twenty-five feet. A yard of twenty acres, with a splendid front, can be bought for $8000. The Clyde is but 200 feet wide, dredged out at a cost of $20,000,000, gold, some 70 feet wide for 18 miles; and an equal yard on its banks could not be bought for $160,000. Vessels have to be launched sideways. The Delaware is well protected against storms and hostile attacks; and so far as food for workmen is concerned, that consumed in England is sent from here. Bar iron cost $11·50 per ton less at Philadelphia than at London, March 11; ship plates $5·97 less. No. 1 pig iron, at the furnace, the same—$30; angle iron thirty-five cents less; sheet iron $6·02 less, with variations that placed bar iron $2·50 less here, and sheet iron 40 cents less; and that also made the London price of ship plates $2·40 less there and of No. 1 pig $1·65 less. Our supplies of coal and iron are illimitable, and the costs of both have been rising there through increased wages and difficulties. And our supplies of timber are inexhaustible. The question of scientific and mechanical skill is settled by the vessels we have afloat, and will be reaffirmed by others. The only labor trouble originates in the impossibility of employing all applicants here, and as the employment increases so will the labor. The English builders have had a monopoly of the best skilled labor at the lowest prices; and this, now weakened, will be wholly changed when employment is certain where food is cheapest. They have, too, been helped by special legislation, that furnished them at cost from bond, and owe much to this protection. The success won here has been in spite of extraordinary charges growing from war prices and fluctuations in values, opposed to very low wages there. It is also expected that Congress will assist the achieved gain by ordering more iron ships for the navy; and it is expected that competent managers of steamship lines will answer the call, because capacity has always replied to other demands. The free ship law is opposed, because any temporary profit it might give would create permanent injury, destroying the opening for industry and the chance to create a great shipbuilding industry of priceless direct, and incalculable indirect, and consequential uses. It is suggested that better ships should be furnished than any that are afloat, in order to secure Atlantic freight and passengers; that Congress should ask proposals for a tri-weekly mail service, in first-class 4000 ton vessels, to be submitted for action as was done by Great Britain. The worth of the steamship business affected by such a project was $134,742,441 in 1872; of which $106,158,371 was freight. In 1861 we earned 71 per cent. of the corresponding payments, where now all but $2,987,520 is paid by us. The entire sum is a drain upon our gold, as it has to be accounted for in that, and has been for ten years, without an attempted remedy.

H. W. PEACE,

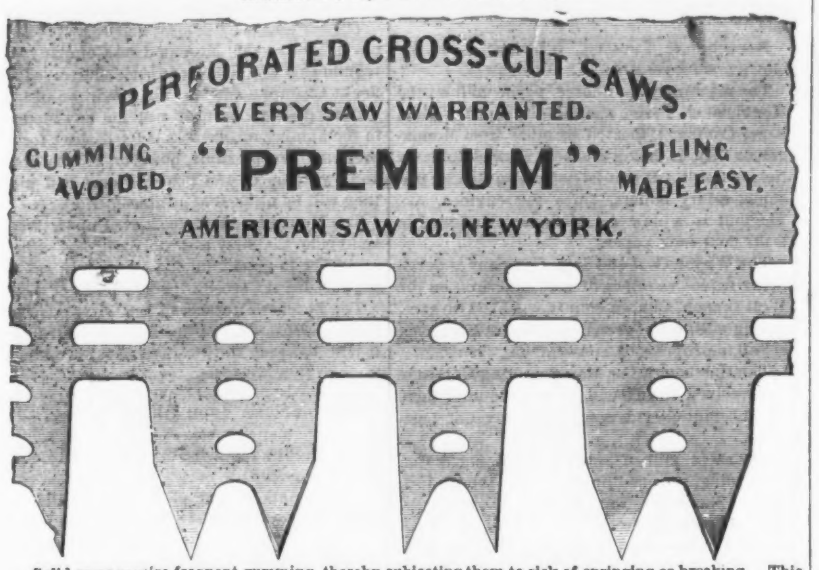
MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

TRENTON, NEW JERSEY.

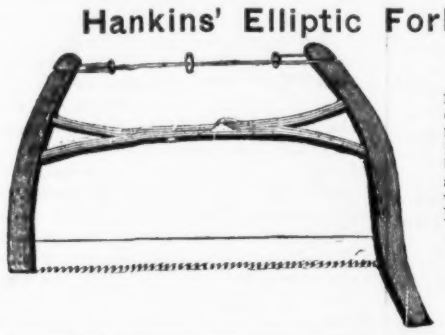


Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having *Patent Teeth*. In the perforated saws **all gumming is avoided** and the teeth are easily kept long and in *proper shape*, saving *files, labor, expense* and *vexation* As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,

VULCAN SAW WORKS,

WILLIAMSBURGH, N. Y.

YALE LOCK MFG. CO.

Office and Works at STAMFORD, CONN., Salesroom 298 Broadway, N. Y.

In addition to their line of Celebrated Locks, would particularly call the attention of the Hardwa trade to their extensive manufacture of

ORNAMENTAL **REAL BRONZE** HARDWARE.

Illustrated Catalogues of which will be furnished on application.

These goods are equal to the **best in the market,** while their **prices** are **very favorable.**

NEW YORK SCREW BOLT WORKS.

(Estate of R. J. DEWHURST, deceased.)

JOHN COCHRANE, Executive Agent and Manager,

Office and Works, cor. Ave. D and 11th St., N. Y.

Bolts, Nuts, Turnbuckles, Washers, Forgings, &c

The attention of large consumers solicited.

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS, TOOLS FOR BRAZING, &c.

Bed Screws, Pin Hinges, and Wire Nails a Specialty.

E. M. BOYNTON,

80 Beekman St., N. Y.

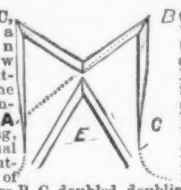
Manufacturer of

LIGHTNING SAWS.

A Challenge of $500, toward expense of a public test, to prove that the Lightning Saws excel all others in Speed, Ease, and Simplicity, has been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws were sold during the year 1872, the purchasers of which testify to their superior merits.

Our leading papers, such as the *Tribune, American Agriculturist, Christian Union*, etc., have published over sixty editorial notices recommending these Saws. Farmer's Clubs, Lumbermen, and Hardware Dealers unite in pronouncing the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws.



A, B, C, represents a common drag saw tooth for cutting in one direction only, for wood sawing, and is equal to both cutting edges of tooth A, B, C, or the tooth E, without loss of space.

B the common V cutting tooth E, of same space. B. C. is equal in its direct action, to both faces of V tooth, consequently the two faces of my M tooth are B, C, doubled, doubling the cut of

This is produced by dressing the two points of my M tooth, to cut in line so that the outside B, C, has four times the space of the slant edge behind it, or from 1 to 5, while slant has space from 1 to 2, the inefficient slant edges are thus practically concealed and do but slight surface cutting, while B, C, edges cut and clear simultaneously.

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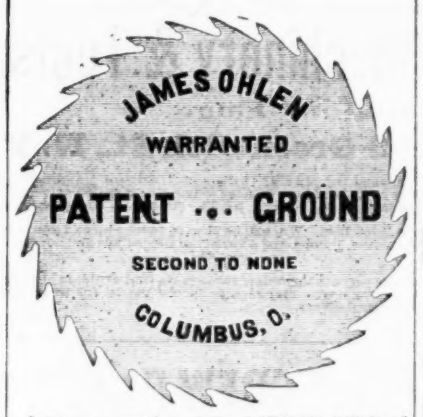

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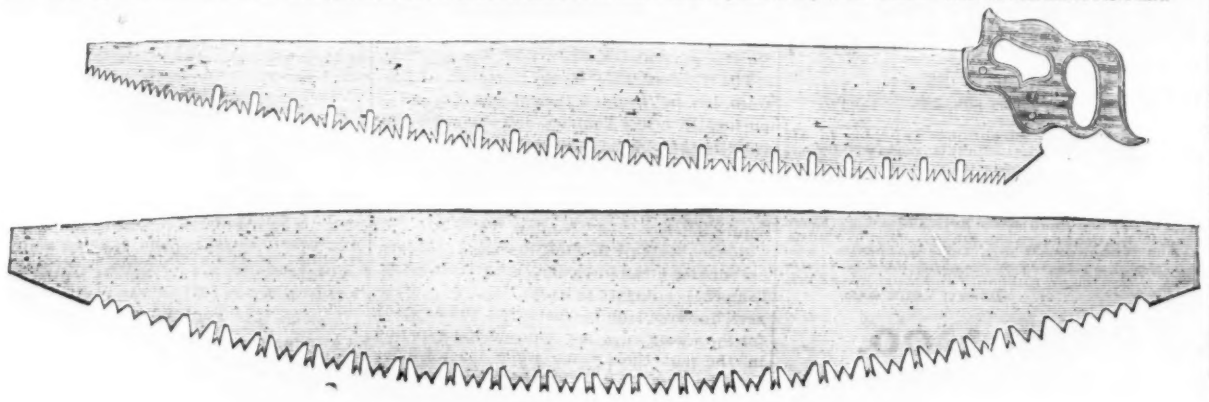

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Practical Observations on Puddling.

BY M. WOLTERS.*

1. OBJECT OF PUDDLING, ITS CHEMICAL THEORY, AND EXPOSITION OF SOME GENERAL FACTS.

The operation of puddling has for its object to remove the carbon from cast iron, so as to convert it into malleable iron, and to eliminate foreign matters which might injure the quality of the metal. We give a brief *resume* of the chemical facts ascertained in this process. The carbon is oxidized, partly by the oxygen of the air, partly, as shown by the jets of carbonic oxide which burn at the surface of the fluid metal, by the oxidized compounds of iron introduced before the operation. The silicium passes readily to the state of silicon by action of the oxigen of the air on the metal, and may even be wholly eliminated without removing much carbon. M. Snelus, of Dowlais, has shown that solid silicium is capable of effecting the reduction of oxide of iron, and the same substance can undoubtedly do so when in the liquid state as in the case of cast iron.

The theory of elimination of phosphorus is still very obscure. Analysis shows that a notable proportion passes into the slag in the form of phosphate of protoxide of iron, and perhaps, too, in that of phosphate of iron. But is this result obtained by the oxygen of the air, or by oxidized compounds of iron contained in the slag? We cannot answer this question; the researches needed to elucidate the point not having been undertaken, or not being known to us. All that we can affirm is, that in the Bessemer process the phosphorus is not eliminated, while in the operation of puddling it is. This might lead us to believe that in the latter mode of elaboration the elimination is due to the action of the liquid slag. The phosphurets of iron being fusible, it may also happen that a part of these compounds is removed by liquation, when the grains of iron, united in bloom, reach a certain hight above the fluid metal. The elimination of sulphur, very imperfect, probably takes place by liquation; for the slags from puddling give off, under action of acids, the characteristic odor of sulphureted hydrogen. It may be that a part of this substance is oxidized by the air, or by the oxidized compounds of iron, though Dr. Percy's experiments show that, if we heat together oxide and sulphuret of iron, there is produced, not metallic iron, but rather magnetic oxide of iron, with liberation of sulphurous acid.

From what has been said it readily appears how a metal rich in carbon, silicium and phosphorus may give a better return than one containing less of these, when the lining of the furnace, and the matters introduced with the charge, are rich in oxygen, which they yield readily. Silicium and carbon alter the tenacity of the metal at every temperature; we have then badly refined or rotten iron. Phosphorus is not injurious in the hot state, but is in the cold; diminishes the tenacity; we have then weak (*tendre*) iron. Sulphur diminishes the tenacity of iron to a much greater extent in the hot state than in the cold; we have then hot-short iron. All these impurities will disappear the more, the longer the metal is liquid, that is, the more carbon there is to be elimmated. A fine grain gives a very close texture, and presents much welding surface to the grains surrounding it. The iron obtained from it is then much harder than that from a coarse grain.

The most highly-carburized iron is that which has the finest grain. The greatest durability is in the most highly-carburized steel. Provided the quantity of carbon is not such as to prevent it becoming malleable, the most highly-carburized iron is also the most tenacious, for, in the same drawing, the fibre obtained is finer, the finer the grain whence it comes; hence, the welding surfaces of the fibre (which determines the tenacity of iron) increase with the fineness of the grain, that is to say, with its carbon contents. *En resume*, the best iron which the fluid metal can give is the purest and the most highly carburized.

Theoretically, puddling includes the following operations: 1. Fusion of the cast metal; 2. Refining of the metal; 3. Refining of the grain; 4. Carburation of the grain; 5. Refining by flame. Practically we have: 1. Fusion of the cast metal; 2. Mixing; 3. Boiling; 4. Raising of the metal and turning operation; 5. Formation of bloom.

A highly carburized metal, which strongly retains its carbon, will evidently give a more highly carburized iron than another which contains less, and yields it more easily when submitted to the same oxidizing influences. The former is, therefore preferable, when a highly carburized product is sought, because it facilitates the work in the fourth period (carburation of the grain). In the same way, a metal which gives in refining of the grain an iron carburized to the extent suitable for making fibrous iron, will render the last two operations (carburation of the grain, and refining by flame) almost useless; they improve, however, the quality of the metal, the fibre becoming finer. Even in working metals of inferior quality, there is considerable gain, in quality of product, from bringing the metal to nature once more. The iron is better carburized and becomes stronger, if care is taken to perform this operation while feeding the mass with a carburizing flame.

2. ACTION OF SLAG DURING PUDDLING.

For a given metal, the work being the same, the quality of the iron obtained depends only on the slag. This has a physical action and a chemical action. The more fluid the slag, the finer are the grains of the iron which the metal gives. The fluidity varies with the temperature of the furnace, and especially with the composition of the slag. The latter may belong to three different types. It may consist, in great part, of ferrous silicates, basic or acid, or of ferric silicates. The ferrous and basic silicates are very fusible, run with difficulty, are oxidized in air, are quickly fixed, and attached strongly to the rabble. In the furnace they appear of a bright white. They are the thick or strong slags. The ferrous and acid silicates are likewise very fusible, run easily, are slowly fixed, and hardly attach at all to the bar; in the furnace they appear of reddish color. They are the thin or soft slags. The ferric silicates are infusible, or, at least, nearly infusible at the temperature of the furnace. They are named iron slags.

What is the physical influence of these slags in the conversion of cast metal into malleable iron? The thick slag does not greatly run from the blooms when these are brought out of the furnace; but it retains sufficient fluidity to come out easily from the mass of iron when shingled. The clean, bright surfaces of the metal come in contact, and are perfectly welded. The first rolling gives bars of a single piece.

Owing to its great liquidity, the thin slag runs off in great part from the iron mass before this has reached the shingling apparatus; the blooms have not sufficient toughness, and break in several fragments under compression. In this case the workmen often throw water on the bloom; coming into contact with the red hot iron, it is decomposed, oxidizes the slag, and makes it thicken; but, on the other hand, it burns the iron, thus increasing the waste and giving a bad quality to the product.

The slags, composed in great part of ferric silicates, owing to their small fusibility, and their tendency to solidify in very little time, do not permit of beating the blooms with ease; the slag does not come out of the mass, the grains of metal remain enveloped by a solidified layer, and do not weld. Drawing gives only pieces of bars, and causes great waste. The proper character of these slags is to make the hearth of the furnace rise, and this may even become so thick that the workmen can no longer keep enough slag to work the iron.

Physically, then, the best slag is a ferrous and basic silicate. Chemically, also, this gives the best product. The ferrous and sufficiently basic slags yield their oxygen slowly enough for the product to be well refined, and the refining to take place not too rapidly.

If the slags are ferrous, but too acid, the refining goes on too slowly; for the bath of slags (very liquid), and the molten metal are distinctly separated. There is, beside, an insufficient quantity of oxidized compounds in the furnace, so that the decarburation has to be done in great part by the oxygen which passes through the grate. In this way the iron is burnt in the refining, as well as the impurities of the fluid metal, and after balling, the very fluid slag runs easily through the metallic masses, leaving the iron bare, and exposed to the oxidating action of the air. It is sometimes seen melting like snow. It is readily understood, then, how it is the thin slags that occasion the greatest waste. They also greatly deteriorate the hearth, dissolving the oxides of it, a deterioration extending even to the plates. The puddler is then obliged to glaze his furnace—that is, to solidify the layer which has been liquified, throwing on the hearth a considerable quantity of water. The result is a notable loss of heat, which can only be compensated by a much greater consumption of fuel. If the slag is or becomes ferric, lumps of iron are quickly formed, which become welded, and neither refining nor carburation are any further possible. Ferric oxide, by reason of the large amount of oxygen it contains, renders decarburation too rapid, and the metallic bath is not sufficiently refined. The first rolling will present a fracture with large grains, and its stripe will be black; it will be dry, impure and hot-short, as well as cold-short.

The thick slags, often designated welding slags, are always the result of a good and sufficiently hot process in the blast furnace. That of the puddling furnace is itself called the hot process. These slags deteriorate the hearth a little, the silicium being found in the metal in the proportion desired, in order that, after its oxidation, it may form with the oxide of iron a silicate, in which the protoxide predominates. Its composition corresponds nearly to the formula $3\,FeO.\,SiO^2$.

The thin slags arise, when metals are heated which are too much siliciurized and little carburized. The latter comes most often from a pretty cold process of the high furnace, resulting from a strong charge with dross from the rolling machine. The treatment of silicious minerals with an insufficient addition of flux, often occasions these products. Lastly, our personal observation enables us to affirm, that the sulphurous minerals, melted with a large consumption of coke, invariably give cast metal containing a large proportion of silicium and little carbon. The process of the puddling furnace characterized by the working of these products is called the cold process. It is often presented the Monday after rekindling, and whenever, after any repairs, a considerable quantity of sand has fallen on the hearth.

The ferric slags are the result of the working of metals containing an insufficient proportion of silicium. It is easy to conceive that, in this case, the mass of iron not being sufficiently impregnated with slag, the protoxide of iron does not find the required quantity of silicium with which it may combine and be transformed easily into peroxide under the action of a continuous oxidizing current. The refined metal of the English being almost free from silicium, is in the same condition as the metals which contain a too small quantity of this substance.

Even when the metal is suitably siliciurised, iron slags are sometimes formed by introduction into the furnace of a bad selection of matters capable of yielding oxygen. The dross of cylinders, the scrapings of finishers, should be carefully avoided; they are oxides, in which the iron is, in great part, at the maximum degree of oxidation, and which always cause the process called dry. The dross of shingling apparatus, in general, is more suitable; it contains ferrous silicates that are very fusible, and properly basic. The ferric or dry slags are often enough obtained by careless workmen, when they tend the grate badly. Too much air may be allowed to pass, and the iron be thus burnt.

They may, further, be formed in consequence of a vicious construction of furnace. A too high vault causes the gaseous current to strike on the upper parts of the iron mass; which, not being sufficiently protected by the slag, are apt to be strongly oxidized.

We have already said that the ferric slags readily become incorporated with the hearth, and render it too thick. The chamber thenceforth, not having volume enough to contain the slag which is formed, this runs out, in great part, by the door, and above, by the small fire bridge. The operation then approaches dry puddling without slag; the oxidation of the iron becomes more energetic, and the hearth continues to rise. If the evil has taken large proportions, the puddler is obliged to let run the slag which remains after removal of the blooms, and to throw on the hearth, before introduction of a new charge, with the dross necessary for obtaining a new slag, fifteen to twenty kilogrammes of filings of metal from the furnace. This, containing a greater or less proportion of carbon, acts as a reducer on the ferric silicates of the hearth, and partly liquefies them. Ordinarily the furnace is restored to a state suitable for working, at the end of two charges.

The refined metal containing almost no silicium, the slag in it is less fusible than that which is produced by the gray or white metal. When this metal is puddled in the same furnace during a whole week, the layer of slags become sometimes so thick, that after cooling off the furnace it is necessary to remove it with a chisel and make a new bottom. With the gray metal, which produces a contrary effect, it is difficult to maintain on the hearth a layer of slags of sufficient thickness.

When, from bad construction of the furnace, the nature of the metal wrought, or any other reason, there is predisposition to the formation of the dry slags, the puddler may still use another means for avoiding a too high hearth. With this view he will not make the charge melt entirely, but, when the metal has been sufficiently softened, he will break it as well as he can with a leveling tool, and will immediately commence mixing. There will thus be less heat in the furnace, since the fusion will not be pushed far enough, the entire mass will remain more or less pasty during the whole duration of the work; and the slag will be in great part removed with the blooms, and will not rest on the hearth. This method will evidently not be suitable where it is wished to obtain irons of quality. The strong and fibrous irons require that the charge be completely melted, that there should be in the furnaces the maximum of heat that can be obtained at the time that mixing commences, and that this temperature should continue so long that the oxides may yield enough oxygen to refine and decarburize the metal completely.

(To be continued).

* Revue Universelle.

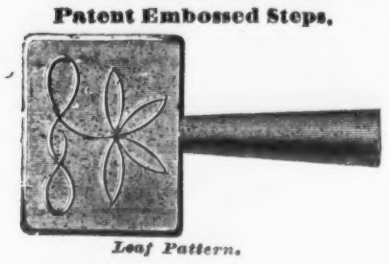
Lead Pipe Manufacture in Cleveland, Ohio.

The Cleveland *Commercial Review* says:

The steady expansion and growth of Cleveland in industrial enterprises is a source of supreme gratulation to its citizens, and a fact which the "outside world" does not fail to observe and duly appreciate. The peculiar advantages of this city as a location for manufacturing in nearly every department was never so fully realized and acknowledged as now, and the assurance that this is so is found in the circumstance that hardly a week passes without some new addition to this class of industry. Among the most recent and important of these additions is the lead pipe works of Messrs. Gibson, Roberts & Beckwith. These works are located in the extensive building at the junction of Superior and Champlain streets, and are now in most successful operation. Mr. Samuel Gibson, the senior partner, is a gentleman of thorough experience in the business, having been actively identified with it fo eighteen years, and having filled the responsible position of foreman in one of the most extensive establishments of the kind in the world. Under his direction the new work have been supplied with the best hydraulic machinery, and with all those appliances which are necessary to the production of the finest quality of work. A recent visit to the works gave us a view of the powerful machinery in operation, and revealed the mystery of the manufacturing of lead pipe of all sizes, with astonishing rapidity and the most perfect precision. The works have a capacity for producing ove seven tons of pipe per day, and the samples thus far made are pronounced by competent judges exceedingly perfect in finish and uniformity. At an early day the proper machinery for rolling sheet lead will be added to the establishment. In the meantime the firm will, as dealers, offer their customers the best makes at the lowest prices. Mr. Fred. A. Beckwith needs no introduction to this community. For years he has been intimately known to our business men of all classes as secretary and treasurer of the Wilson & Hughes Stone Company, and in other relations which he has ably and creditably filled. Mr. W. J. Roberts comes among us from Cincinnati, and will prove himself a valuable accession to the ranks of our young business men. This new firm will undoubtedly receive a cordial welcome from all interested in this branch of trade, and we take pleasure in recommending plumbers and dealers in lead pipe and sheet lead not to fail to give this establishment an opportunity to supply their wants.

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



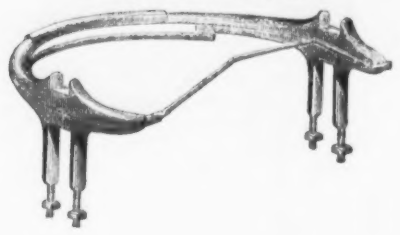
Leaf Pattern.

Star Pattern.

Established 1850.

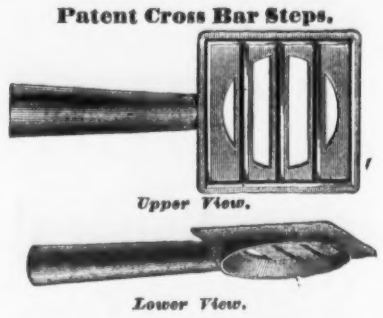
King Bolt Yokes.

No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.

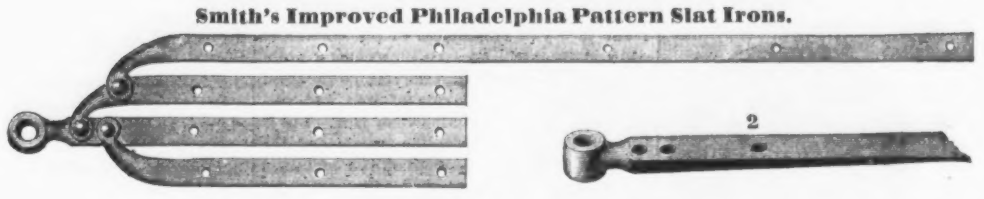
Patent Cross Bar Steps.



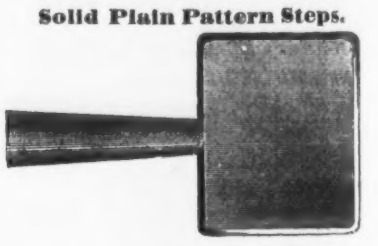
Upper View.

Lower View.

Smith's Improved Philadelphia Pattern Slat Irons.



Solid Plain Pattern Steps.



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Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.

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Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs,

Of any Pattern or Style. Also for **AXLES of any description, from a COMMON LOOSE COLLAR to the FINEST OF STEEL.**

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved machinery, we defy competition.

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CARRIAGE BOLTS.

Buy the Best.

Clark's Patent Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not turn in its place.

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Carriage and Tire Bolts,

NORWAY IRON,

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Philadelphia List.

Trade Mark.

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CHARCOAL IRON,

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Our I X L Bolt is made from approved brands of Iron, and is equal in every point of appearance to the regular Philadelphia Carriage Bolts, being made on the same machinery, and the quality is not surpassed by any bolt of like grade in the market.

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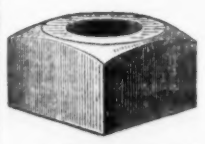

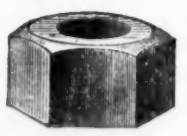

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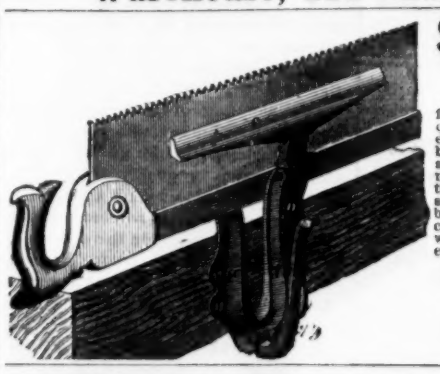

Stearns' Patent Saw Vise

No. 1.

This simple and effective device for holding saws for the operation of filing is too well known to require more than a passing description here. Its well earned popularity during the long period that it has been upon the market, establishes its superiority over all other saw vises. It is the only saw vise in the market that is so constructed as to spring or strain the saw, preventing vibration and effecting a great saving in files. The vise can be readily attached to a bench, and being small and light, can be conveniently carried about from place to place—in fact, filling a want long felt by saw filers and wood workers generally. Send for Illustrated Catalogue to

GEO. N. STEARNS & CO.,

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Iron & Brass Wood Screws.

Full assortment constantly on hand.

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Manufacturers of

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Cold Pressed Nuts and Washers, Etc.,

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Price lists sent on application.

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BEST SWEDES STEEL,

Sword Tempered, and

Common Patent Tempered SPRINGS

Of every description, made to order.

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Olmsted Patent and Common Oilers,

of all descriptions,

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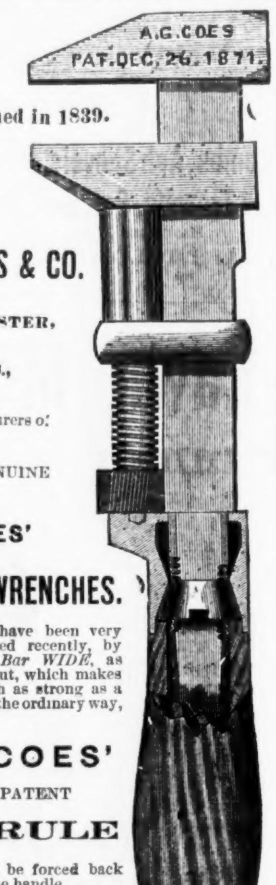
and Index to Advertisements.



Established in 1839.

A. G. COES & CO.

WORCESTER, Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

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Manufacturers and Dealers in
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a specialty.
Price lists on application.

GEM
Water Meter.

We would beg to call attention to our new Improved Gem Meter, which is not only adapted to measuring *Water*, but it can be also used for *other Fluids with confidence*

Our present facilities are such that, with new and Improved Machinery, we can fill orders promptly for all sizes on the list.

Should any Water Department feel desirous of testing our **GEM METER**, by actual use with other patents, we will furnish one for that purpose, to be thoroughly tested for two months, when it can be either paid for or returned to us. at our expense, if not found satisfactory.

National Meter Co.,
J. C. KELLEY, President,
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☞ A pamphlet entitled, *"Justice & Economy in Public Water Supplies,"* sent on application.

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B. KREISCHER & SON.,
New York Fire Brick &
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CLAY RETORT WORKS,
Established 1845.
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The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island by the cargo or otherwise.

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ESTABLISHED 1836.
JOHN R. WATSON, Perth Amboy New Jersey
Manufacturer of
FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE

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Manufacturers of all shapes and sizes of **FIRE BRICK** for Founderies, Rolling Mills, Blast Furnaces, Stove Works, Lime Kilns, &c. A full stock of McKensie and other Cupolas. Also Fire Clays and Sand constantly on hand. Shipments made at the shortest notice. Send for Circular.

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Salamander & Albany Fire Brick Works,
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NEWTON & COMPANY,
(Successors to Palmer, Newton & Co.,) Manufacturers and Wholesale Dealers in **FIRE BRICK** of every variety and shape, Stove, Range and Heater Linings, Portable Clay Furnaces, Fire Clay, Fire Sand, Mica, Kaolin, &c
HORACE B. NEWTON. JOHN M. NEWTON.

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CRUCIBLES.
Manufactured by
ADAM NEWKUMET,
1537 & 1539 N. Front St., Phila., Pa.,
For Steel, Brass, Nickel, Copper, Bronze, &c,
Equal to any in the market, and all guaranteed.
☞ Keeping a full stock of all sizes on hand, and being confident of giving *entire satisfaction* we respectfully ask consumers to give us a trial.

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ESTABLISHED 1846.
HALL & SONS, Buffalo, N. Y.
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FIRE BRICK
of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, ROCKINGHAM WARE, YELLOW WARE, Fire Clay, Fire Sand, Kaolin, Ground Fire Brick, and Dimantine Building Brick.

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AND
Clay Retort Works,
AND KENSINGTON FIRE BRICK WORKS.
Office, 23d and Vine, Philadelpia.
PHILIP NEWKUMET,
Successors to JOHN NEWKUMET, Proprietor
manufactures 9-inch Fire Bricks, Tiles, and Blocks, for Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Glass Houses, &c., &c
Articles of every description made to order at short notice, and in a very superior manner.
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Manufacturers of
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BRICK PRESSES,
For Fire and Red Brick.
PATENT STEAM GEARING
For grinding Clay for Red or Fire Brick, and all kinds of **Brick Machines** in general.
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Oldest and Largest Establishment of the kind in the U. S.
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ISAAC ADAMS, JR., Prest NEW YORK.

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VEGETABLE FELTING CO.,
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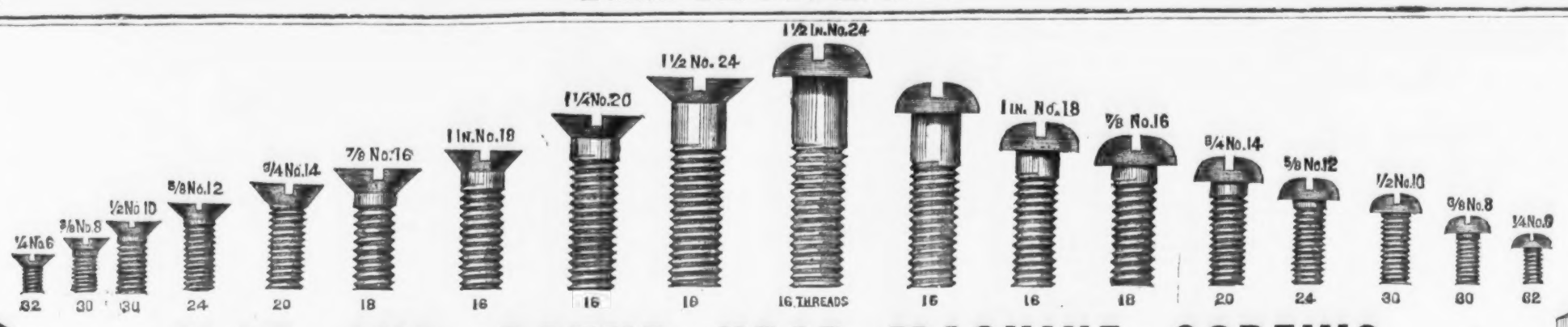

FLAT AND ROUND HEAD MACHINE SCREWS,

OF SIZES, Nos. - - 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, SCREW GAUGE.
AND LENGTHS - - 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/4, 1 1/2 INCH.

PLUG AND BOTTOMING TAPS.

Manufactured, **KEPT IN STOCK**, and sold by

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Fillister Head and Pattern Machine Screws Made to Order Promptly.

Braces, Curry Combs, Ash Shovels, Ferrules, Chisel Rings, Garden Trowels, Pat. Ox Bow Pins, &c.

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FOR USING

L. B. Taylor's Patent Speed Indicator.

To ascertain the number of revolutions made by a shaft in any given time: Take the Indicator by the handle in the right hand, holding your watch in the left, press the point of the spindle gently against the end and center of the shaft. To every hundred revolutions of the shaft the Hundred Pointer will make one revolution, while the Thousand Pointer will indicate one number, the dial being marked into ten parts. It may be applied to a shaft revolving either to the right or left.

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Manufactured only by CONN. CUTLERY CO., NAUGATUCK, CONN.,

TO WHOM ALL ORDERS SHOULD BE ADDRESSED.

The Novelty Lawn Mower and Trimmer.

THE SIMPLEST,
CHEAPEST,
LIGHTEST,
AND BEST.

It has the only correct principle, viz.: the Field Mower Cut.

It is the only Lawn Mower that Can Cut Long Grass and do the Trimming.

Does all the Work of a Sickle or Shears.

It is the Lightest Machine in use, Weighing only Twenty Pounds. A Child can Work it.

The Construction is so Simple that it can not get out of Order.

PRICE LIST.

No. 1—14 inch Cut	$15·00
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MANUFACTURED BY

GEO. DWIGHT, Jr., & CO.,

Hillman Street, Springfield, Mass.

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BOLTS AND NUTS,

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210 Lawrence St., Lowell, Mass.

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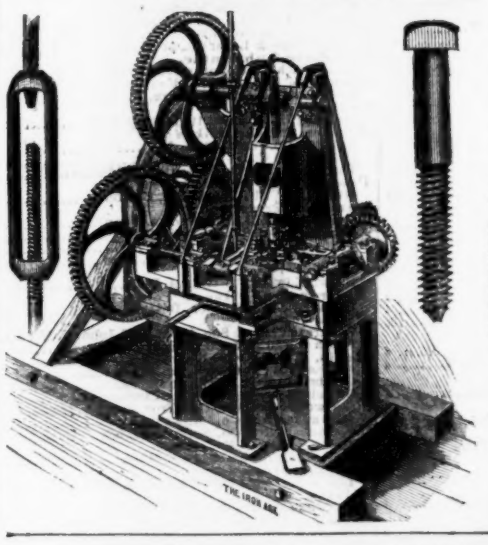
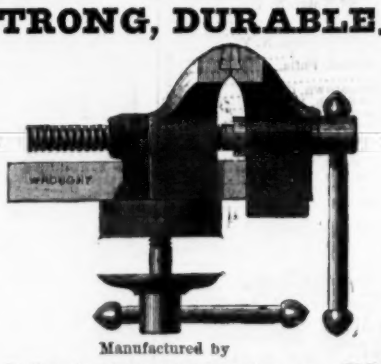


With increased facilities we are now enabled to pay prompt attention to all orders for our **Patent Bolt Heading Machine**, now fully acknowledged the best ever invented. Our Machines will head Bolts from ¼ inch diameter to 1⅜ diameter, and from ⅜ inch to 48 inches long, or longer if necessary, and almost any description of heads—Square, Hexagon, T head, &c. and properly attended, without changing, will head from 3000 to 5000 per day. We are also prepared to offer for sale our **New Patent Bolt Cutter**, which will cut Bolts from ¾ inch diameter to 1¾ inclusive. A boy will cut on an average 400 ¾ inch Bolts per day. Parties wishing first class Bolt Heading Machines or Bolt Cutters, we would respectfully invite to call at our works, where they can at all times see the Machines in operation and judge for themselves. Perfect satisfaction guaranteed in all cases. For references and any other information in regard to the above, apply to the **American Bolt Co., Lowell, Mass.**

PARALLEL SWIVEL VISE,

STRONG, DURABLE.



Wrought Iron Bar. Width of Jaw.	Weight.	Solid Box. Price
4 in.	50 lbs.	$11·00
5 "	80 "	13·00
6½ "	130 "	17·00
8 "	167 "	22·00

Manufactured by

CHARLES MERRILL & SONS,

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STANDARD

Platform and Counter

SCALES,

Fletcher St., Lowell, Mass.

240 lbs. Scales a specialty.

AMAZON INS. CO.

Cincinnati, O.

Cash Capital, - - $500,000.

WITH AMPLE

Re-Insurance Reserve.

GAZZAM GANO, *President.* B. D. WEST, *Secretary.*

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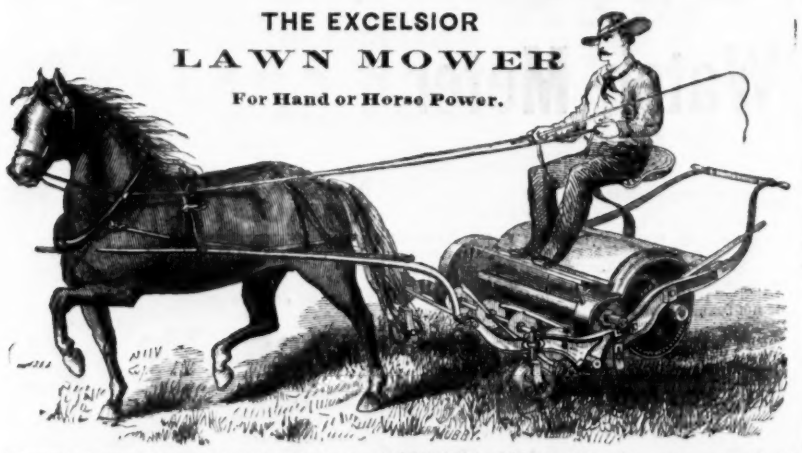
LAWN MOWER

For Hand or Horse Power.



Manufactured by CHADBORN & COLDWELL MFG. CO., Newburgh, N. Y.

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Birmingham Shovel Co.,

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Manufacturers of

LOWMAN'S PATENT CAST STEEL

SHOVELS, SPADES & SCOOPS

Of all Descriptions,

Without straps or rivets, of the best English and American Cast Steel. Every Shovel warranted. Printed lists of prices and discounts to be had on application at the office.

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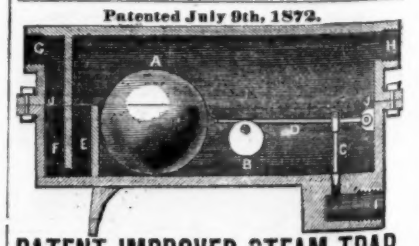
Patented July 9th, 1872.



PATENT IMPROVED STEAM TRAP.

The only self-regulating Steam Trap in the world. For full description send for circular to

A. L. JONES,

Steam Heating Establishment, 150 S. 4th Street, Phila.

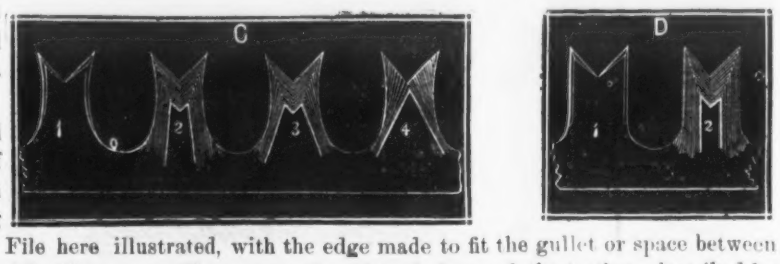
ATTENTION!! HALT!!

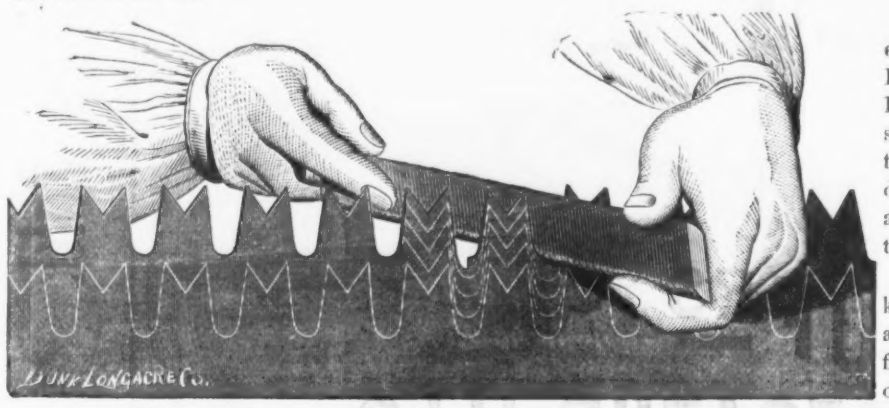
IMPORTANT to Hardware Dealers, Lumbermen, and all Parties interested in Cross-Cut Saws.

We desire to call special attention to our various styles of Cross-Cut Saws represented in this week's issue. In the manufacture of all our Fast Cutting Saws, we have carefully avoided the pernicious and destructive practice of making UNDER-CUT TEETH.

All saws made on this principle are miserable failures. It is simply a rip tooth to the purpose of cross cutting, an idea which has been long ago exploded. To get an UNDER CUT, the tooth must be wider at the extreme point than at any other part, and each successive filing must result in rapid reduction in the width and ultimate loss of shape, as shown in the annexed diagrams:

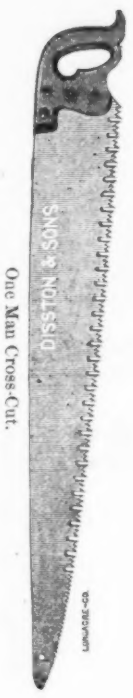
No. 1, Fig. C, represents the undercut tooth as it leaves the factory; Nos. 2, 3 and 4, Fig. C, shows how No. 1 must ultimately become under any style of filing that may be adopted. No. 1, Fig. D, shows a tooth with parallel edges, and No. 2, Fig. D, shows the shape of said tooth after several filings. The white line on the diagrams represent the successive cuts of the file.





On the other hand, the annexed engraving represents a section of Lumberman Cross-Cut Saw, with File specially adapted for keeping said Saw in order. By using the File here illustrated, with the edge made to fit the gullet or space between the teeth, and pressing downward while filing, you will preserve the original shape of the teeth as described by dotted lines and notch in engraving. You pay for the edge of the file as well as the flat—then why not use it? and thus keep your Saw always gummed and in order, and avoid the risk of breaking or buckling the Saw by the old method of gumming.

This File is manufactured expressly for the purpose of keeping in order the teeth of our Improved Saws, known as the Climax and Lumberman, and can be used with equal facility on either Saw. If the file be used according to our instructions, viz.: pressing down in the gullet at the same time the edge of the tooth is being filed, the effect will be so convincing that persons will never return to the use of the old style File, or any other of the so-called improved teeth. We also manufacture a File for keeping the Great American and Climax in order.



One Man Cross-Cut.

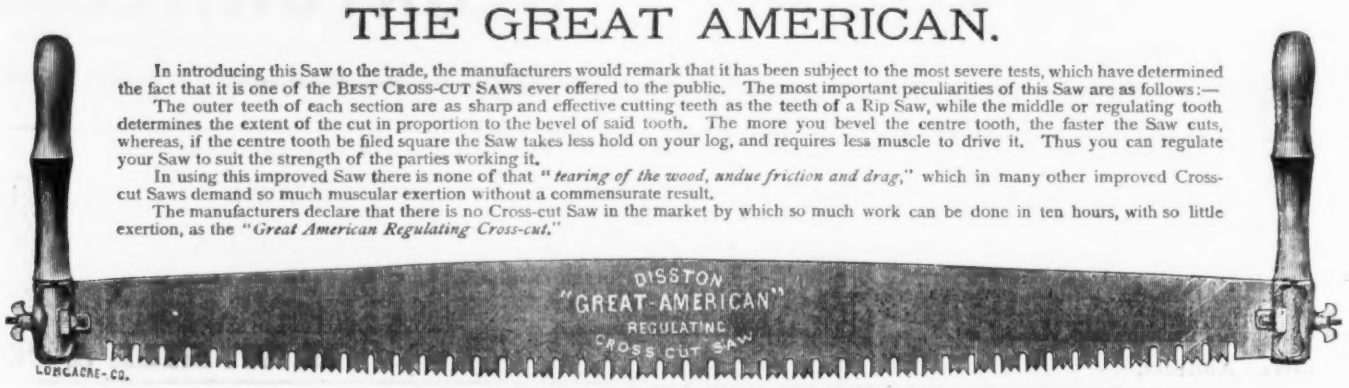
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag*," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

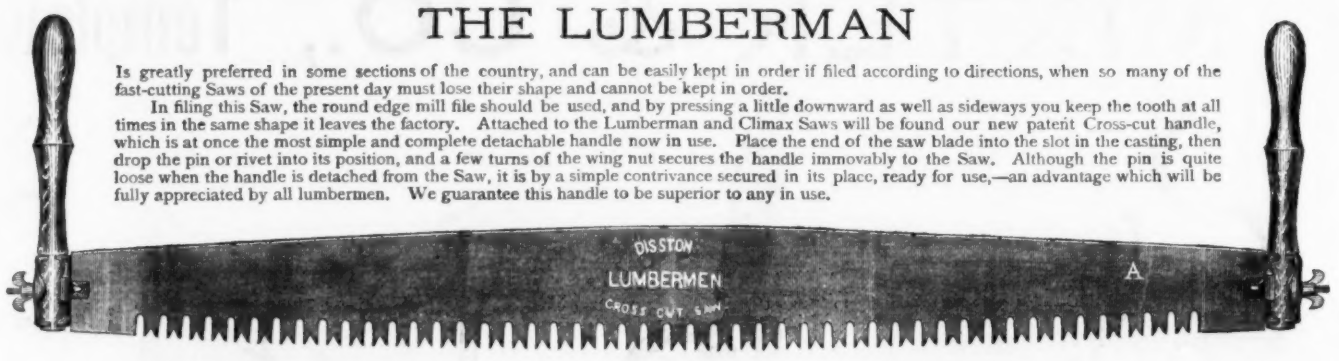
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.

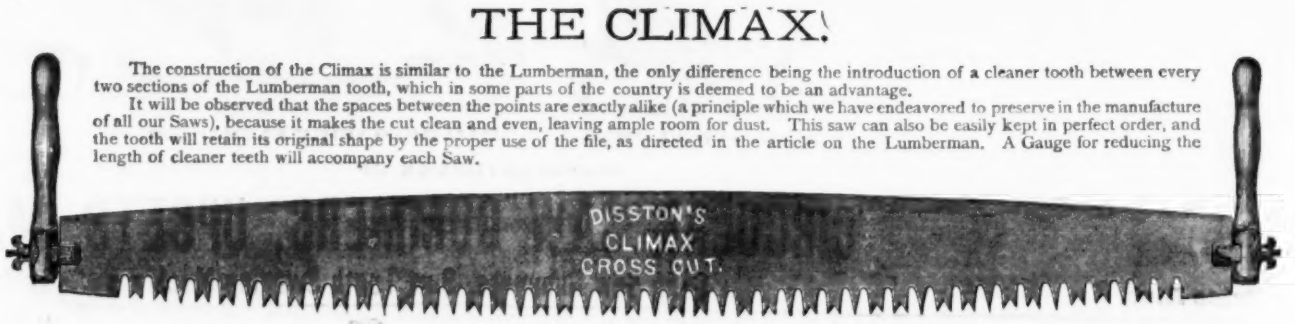


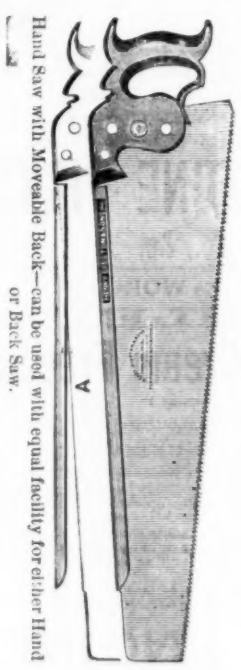
Improved Pruning Saw and Knife. Patented August 19, 1873

THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



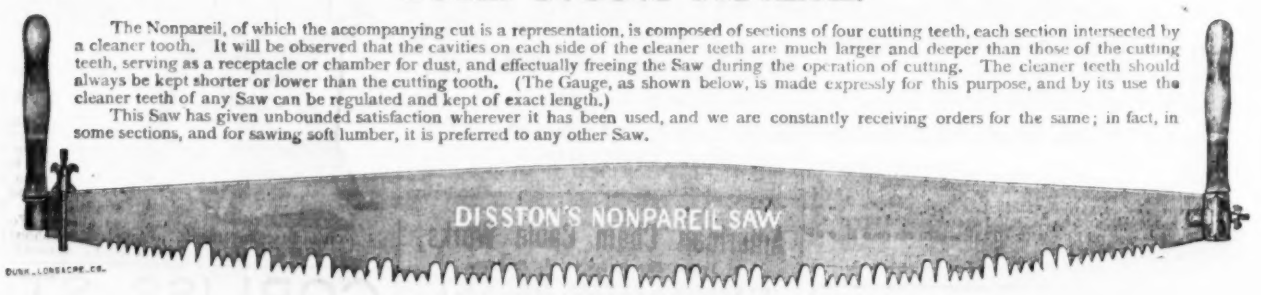


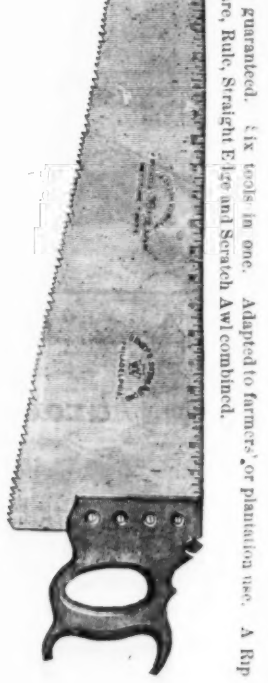
Hand Saw with Moveable Back—can be used with equal facility for either Hand or Back Saw.

THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.

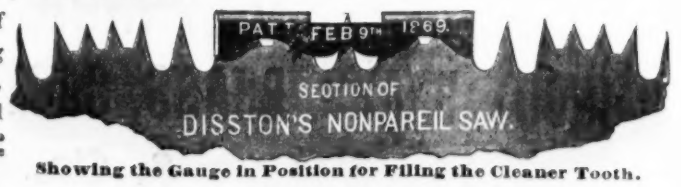




A cheap Saw, fully guaranteed. Six tools in one. Adapted to farmers' or plantation use. A Rip and Cross-Cut Saw, Square, Rule, Straight Edge and Scratch Awl combined.

Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of uniform length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled operator.



Showing the Gauge in Position for Filing the Cleaner Tooth.

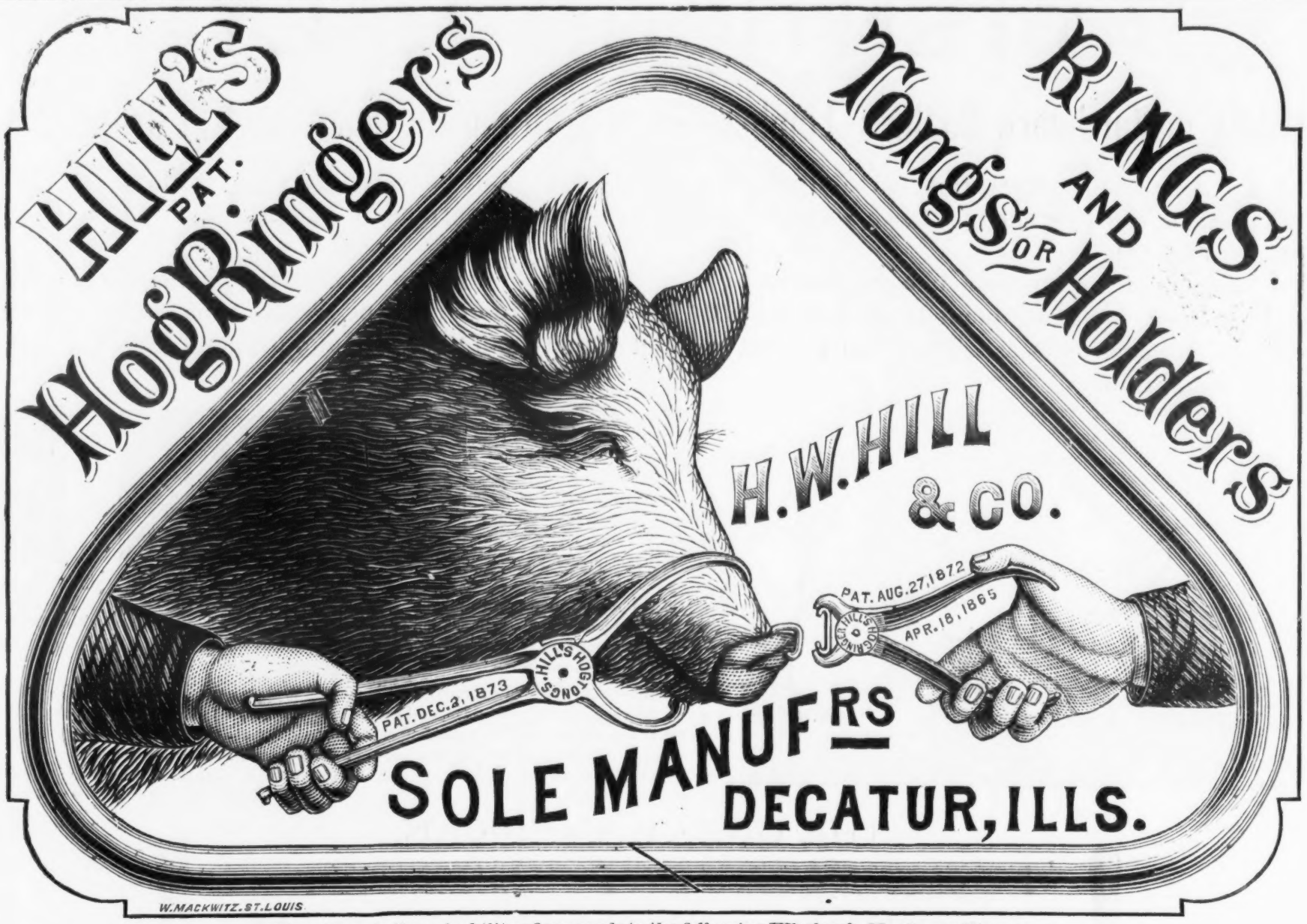
HENRY DISSTON & SONS, Philadelphia.

60,000 Ringers Sold.

HILL'S PAT. HogRingers

RINGS AND Tongs OR Holders

11,500,000 Rings Sold.



SOLE MANUFRS DECATUR, ILLS.

W. MACKWITZ, ST. LOUIS

We refer as to the saleability of our goods to the following Wholesale Hardware Houses:

WM. BLAIR & CO., Chicago, Ill.
SEEBERGER & BREAKEY, Chicago, Ill.
BRINTNALL, TERRY & BELDEN, Chicago, Ill.
MARKLEY, ALLING & CO., Chicago, Ill.
MILLER BROS. & KEEP, Chicago, Ill.
EDWIN HUNT & SONS, Chicago, Ill.
KINGMAN & CO., Peoria, Ill.
CLARK, QUIEN & CHALMERS, Peoria, Ill.
TOPPING BROS., Alton, Ill.
HARWOOD BROS., Bloomington, Ill.
MOREHOUSE & WELLS, Decatur, Ill.
CLOSE & GRISWOLD, Decatur, Ill.
SMITH & HUDSON, Springfield, Ill.

WADSWORTH & CO., Jacksonville, Ill.
ROCKWELL & ADAMS, Jacksonville, Ill.
G. J. COTTRELL, Quincy, Ill.
BAUM & LONG, Quincy, Ill.
ANDERSON, BULLOCK & SCHOFIELD, Indianapolis, Ind.
C. FRESE & CO., Indianapolis, Ind.
CAMPBELL, CASON & CO., Lafayette, Ind.
J. B. FALLEY, Lafayette, Ind.
JOHN W. HEATH, Lafayette, Ind.
JOHNSON & REULE, Lafayette, Ind.
A. G. AUSTIN & CO., Terre Haute, Ind.
WM. J. HEBERD'S SONS, Vincennes, Ind.

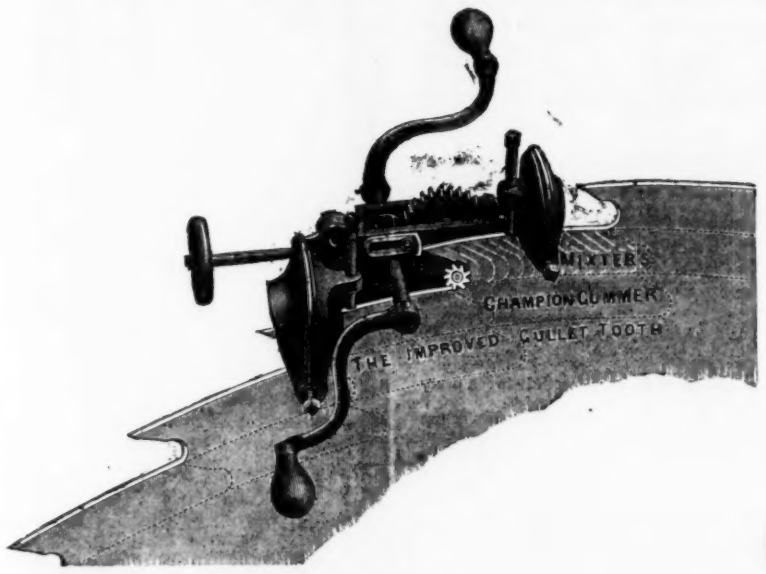
R. W. BOOTH & CO., Cincinnati, O.
HOWELL GANO & CO., Cincinnati, O.
KRUSE & BAHLMAN, Cincinnati, O.
W. A. McCALL & CO., Cincinnati, O.
DICKSON, CLARK & CO., Cincinnati, O.
PERIN, GAFF & CO., Cincinnati, O.
KILBOURNE, JONES & CO., Columbus, O.
HOMER C. LEWIS, Columbus, O.
LOCKWOOD, VAN DOORN & MILLER, Cleveland, O.
WM. BINGHAM & CO., Cleveland, O.
LOOMIS, BARNETT & PRITZ, Dayton, O.
GREEN & HERRON, Dayton, O.
ROGERS, KEIFER & ENGLE, Dayton, O.

WHITAKER, PHILLIPS & CO., Toledo, O.
C. GERBER & CO., Toledo, O.
HAMILTON & CO., Toledo, O.
JOHN NAZRO & CO., Milwaukee, Wis.
SICKLES & PRESTON, Davenport, Iowa.
NELSON & CO., Burlington, Iowa.
ALLEN & WHIPPLE, Burlington, Iowa.
J. D. SEEBERGER, Des Moines, Ia.
WICKERSHAM & LOURIE, Keokuk, Ia.
A. F. SHAPLEIGH & CO., St. Louis, Mo.
McLAREN, WILLIAMS & CO., St. Louis, Mo.
RASHCOE, MILLER & CO., St. Louis, Mo.
McCOMBS, KELLER & BYRNES, St. Louis, Mo.

GARDNER & MULLET, Kansas City, Mo.
J. E. FORBES & CO., Kansas City, Mo.
J. L. KELLEY & CO., Kansas City, Mo.
O. T. BULL, Louisville, Ky.
A. McBRIDE, Louisville, Ky.
OWENS & BARKLEY, Mayaville, Ky.
FORD & OSBORN, Paris, Ky.
W. HOFFMAN & SON, Mt. Sterling, Ky.
J. M. HAMILTON, Nashville, Tenn.
HOGAN, CLARK & SLEEPER, Boston, Mass.
TINTSMAN & RUMBAUGH, Mt. Pleasant, Pa.

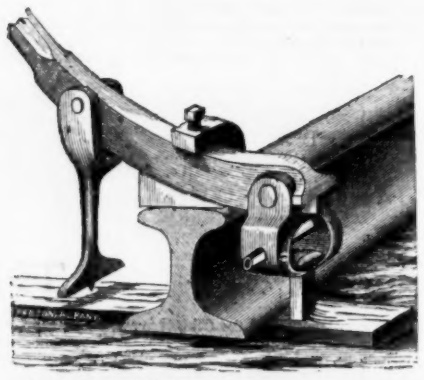
For Circulars and Price Lists, Address, H. W. HILL & CO., DecaturI, Ills.

J. W. MIXTER & CO., Templeton, Mass.

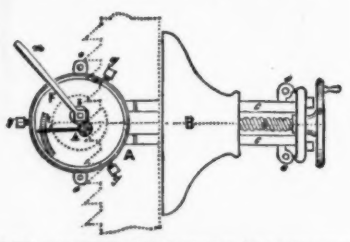


Send for Price List.

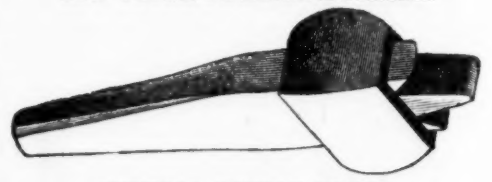
GANG SAW GUMMER.



RAILROAD SPIKE EXTRACTOR.



SAW TOOTH SWAGING MACHINE.



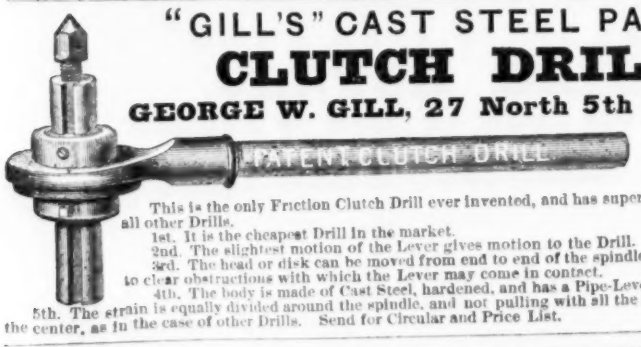
MIXTER'S DOUBLE UPSET.

Wanted Local and Traveling Agents in every section of the country. Agents and Dealers write for terms.

MANUFACTURERS OF

CIRCULAR SAW GUMMERS, UPSETS, MILL STONE PICKS,

Gang Saw Gummers, Saw Tooth Swaging Machines, Spike Extractors, &c., &c.



"GILL'S" CAST STEEL PATENT

CLUTCH DRILL,

GEORGE W. GILL, 27 North 5th St., Phila.

This is the only Friction Clutch Drill ever invented, and has superior advantages over all other Drills.
1st. It is the cheapest Drill in the market.
2nd. The slightest motion of the Lever gives motion to the Drill.
3rd. The head or disk can be moved from end to end of the spindle, thereby being able to clear obstructions with which the Lever may come in contact.
4th. The body is made of Cast Steel, hardened, and has a Pipe-Lever screwed in same.
5th. The strain is equally divided around the spindle, and not pulling with all the strain on one side of the center, as in the case of other Drills. Send for Circular and Price List.

Anti-Friction Metal,

INGOT BRASS, BRASS CASTINGS.

Du Plaine & Co.,

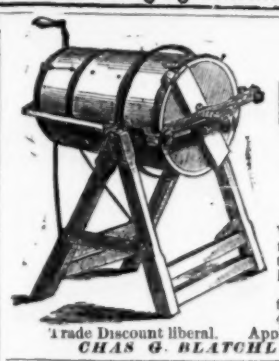
1303 & 1305 Buttonwood St., PHILADELPHIA.

Chain.

CAIN, GORDON & CO.,
Union Chain & Anchor Works,
1845 Richmond Street.
Office S.W. cor. Queen & Swanson Sts.
PHILADELPHIA.

American Chain Cable Works,
28 *Years' Experience in the Business.*
KENDRICK & RUNKLE, Trenton, N. J.
Manufacturers of **Cable, Crane, Coal Mine Slope, Car Brake Chains, Traces, Breast, Binding, Cow and Log Chains** of all kinds.
N. B.—The highest grades of Crane Chains a specialty.

New England Chain Works
771 Eddy Street, Providence, R. I.
Manufacture **Iron Chain** of every description.
Mowing Machine, Crane, Break, Draft Chains, &c., &c.
Also, **Latest Improved Cotton Can Rings.**
THOS. WYATT, Proprietor.



"The BEST in the WORLD!"

BLATCHLEY'S

Horizontal Ice Cream Freezer,

(Tingley's Patent)

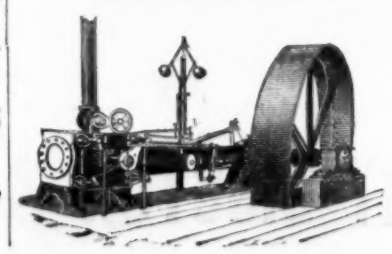
For Saloons, Hotels, Ice Cream Manufacturers, or Families.

STANDS ENTIRELY UNRIVALED!

With the aid of *this* Freezer a most delicious dessert of Ice Cream, Water Ice, or Frozen Fruits, Custards, &c., may be frozen in from five to eight or ten minutes, at the will of the operator, with almost no trouble and but trifling expense. It is acknowledged the "Best Freezer in the World," and a luxury no family should be without.
The Closed Head will save Ice enough in one season to pay for the Machine. The Tub requires but one filling to freeze. Sizes 3 to 40 quarts. For sale by the trade generally.
Trade Discount liberal. Applications should be accompanied by business card.
CHAS. G. BLATCHLEY, Manufacturer, 506 Commerce St., Philadelphia, Pa.

CORLISS STEAM ENGINE.

The Best in the World for Economy in Fuel and Cost of Running.

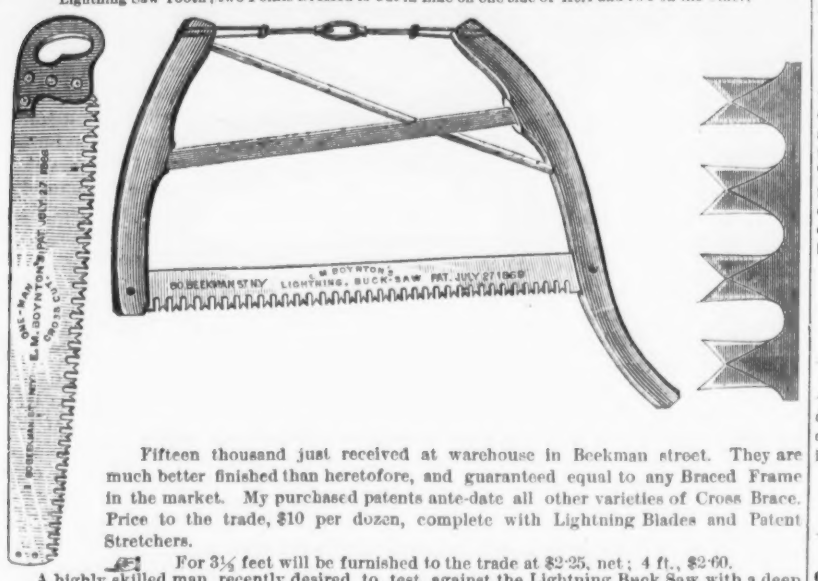


BUILT BY

Robert Wetherill & Co.,
Chester, Pa.,
Engineers, Machinists, Founders,
And BOILER MAKERS.

Stationary Engines, Shafting, Mill Gearing, Hoisting Machines, Improved Piston Packing and Machinery.
Special attention given to Boring Ports and Cylinders.

Lightning Saw Tooth; two Points Dressed to Cut in Line on one side of Kerf and two on the Other.



Fifteen thousand just received at warehouse in Beekman street. They are much better finished than heretofore, and guaranteed equal to any Braced Frame in the market. My purchased patents ante-date all other varieties of Cross Brace. Price to the trade, $10 per dozen, complete with Lightning Blades and Patent Stretchers.

☞ For 3½ feet will be furnished to the trade at $2·25, net; 4 ft., $2·60.

A highly skilled man recently desired to test against the Lightning Buck Saw with a deep gummed saw similar to the V tooth, dubbed "Lumberman Saw." The said individual got beaten 100 per cent. the first time, and every form of test, by time and by stroke, left it from 50 to 100 per cent. behind! This was done here, in presence of numerous witnesses a few days since.

NEXT!?

A sly old fox again last week insisted that my "GRAPES WERE SOUR." On account of the *overhang* he could not get at them! He did not tell how highly he had recommended my Patent Lightning Saws in years 1868 and 1869, or (although a record is kept) the $25,000 jump he made at them for a taste, and that after eighteen months of investigation! He did not tell WHY he so desperately imitates my goods now.

He did not tell why he did not accept my offer to have the matter settled by a public test. Is this the reason why?

"By hand, two men cut off a twelve inch sycamore (buttonwood) log in *eight seconds*, before Major-General Meade and other distinguished men, at Independence Square, Philadelphia, September 1, 1869. We also note, as a proof of the ease that permits sustained effort, the sawing, by hand, of twenty-six cords of hard beech, maple, elm, ash and hickory wood in eight hours (ten hours, including lost time) in Michigan. Such work, by two men with one saw once filed, is wonderful.

"These saws are made and sold by Mr. E. M. Boynton, 80 Beekman street, New York, and are protected by four patents, dated, respectively, Nov. 27, 1866; July 23, 1867; January 14, 1868; July 27, 1869. We trust that the inventors of so valuable an improvement, in an article of such universal use as the saw, will be able to enjoy the fruit of their labors free from infringement or piracy of any kind.—(*The Iron Age, April* 7, 1870)."

He insists that gumming saw teeth with files is a *modern* method. He proves that as my saw tooth contains all others, it is easily filed *any desired way*. If a few dressings makes the angle of my saw like Lumberman or any other V tooth, why they can keep it so, if they like. I think a little more steel (not steal), useful, although he insists the wider the M the sooner it is filed to a V. He may have made and sent out such wretched samples of hook teeth as he now publishes to my injury, but hundreds of thousands who have bought my goods can certify that the dressed edge is straight always, although wide at point for durability.

Fig. 1.—E. M. Boynton's Patented Lightning Saw as Made in 1868 and 1869.

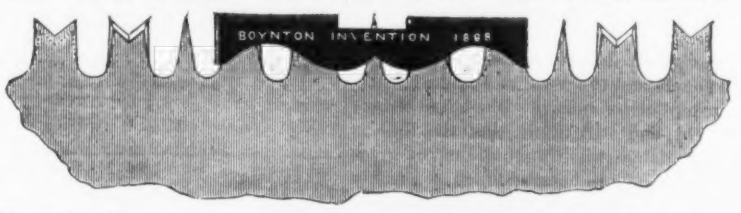
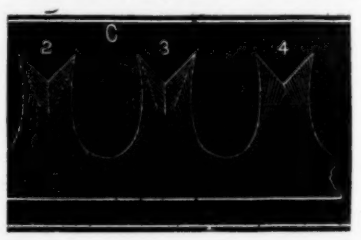


Figure 1 and 2 are exact copies of my manufactured goods and tools in 1868 and 1869 (except the file), and the public will judge of the originality of his imitations or the justice of his caricatures of my Saws, which may be filed in any way desired. The special File, made for filing the center of my M teeth, I am manufacturing in quantity, and can furnish at $6 per dozen—10 inch. I can furnish round edged Files to any who want to gum Saws *expensively*, but a 75 cent emery wheel will save you $25 per saw. A slight reflection will show that in many instances men spend more than the original cost of a Saw in filing away saw plate, when only one hundredth of an inch of point is dulled in use, and a slight dressing of points in the center short M ens thus up to the undulled edge, which will require but slight edging, thus saving the shape perfectly and economizing a square inch of steel instead of the point of steel of other saws, or thrice the durability without gumming, saving files, time and money greater than the cost of the Saw on each set of teeth. But if you cannot afford to buy all these four other varieties of imitation Saws, recollect that a genuine Lightning Saw contains them all, and see that by this Disston misrepresentation of my goods a Champion and Lumbermen is the worn out result. Truly the greater includes the less. (See Fig. C, 2, 3 and 4.) *They cannot furnish Lightning Saws.*



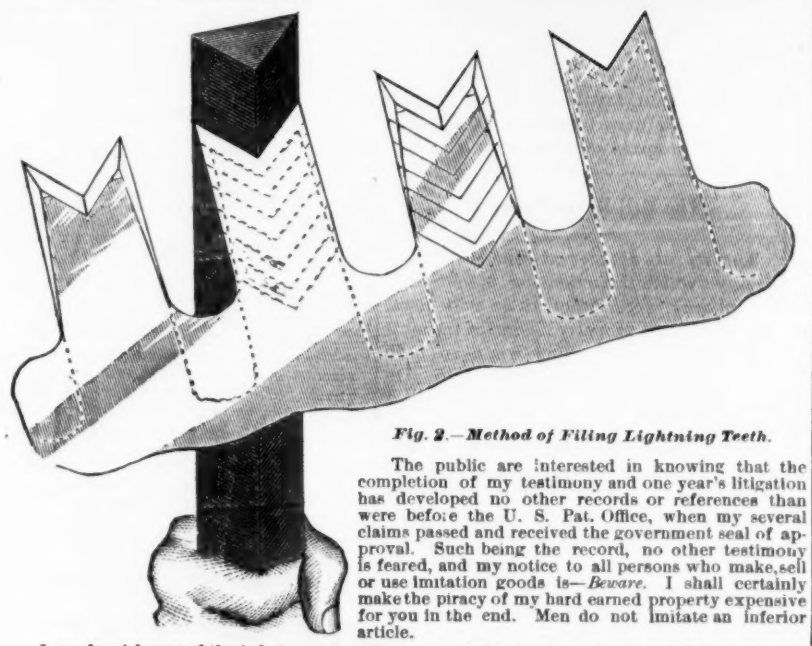


Fig. 2.—Method of Filing Lightning Teeth.

The public are interested in knowing that the completion of my testimony and one year's litigation has developed no other records or references than were before the U. S. Pat. Office, when my several claims passed and received the government seal of approval. Such being the record, no other testimony is feared, and my notice to all persons who make, sell or use imitation goods is—*Beware*. I shall certainly make the piracy of my hard earned property expensive for you in the end. Men do not imitate an inferior article.

I can furnish any of the inferior and really unpatented imitations at prices defying competition, as I do not depend on the old V tooth for a living. I will protect my customers in a fair profit on my patented goods. To all fair minded men who are interested in making, selling and using saws, I appeal to stand by the only improved cutting tooth saw ever invented and patented, for with my efforts within a few years it has trebled the sale of cross cut saws. While I have prospered the public have been educated in scientific timber cutting—no small thing when it is asserted that a Billion Dollars is the annual Wood, Lumber and Timber crop of America. Four times the value of our wheat crop.

As it costs a year and a Thousand Dollars to wear out a cross-cut saw, a saving even of ten per cent. is a great saving to the toiler; also the immense waste in cutting wood with Axes is almost incredible; any one engaged in cutting cord wood, will tell you that the tough and Knotty Timber, and chips are wasted, when they may become good stove wood, if the logs are cut short with my cross cuts, as blocks of one foot in length are *easily hauled and split*.

The savings of timber and time by the scientific use of saws, it is computed, would equal the annual interest on the U. S. Public Debt *Saved*, and the toil of millions of farmers be lightened, if they will only learn to use saws to cut their wood.

Study carefully the demonstration on page 10th, and note extra steel and durability of my M teeth over the old V tooth. The V tooth represents a zig zag fractured plate for wearing off timber. The Lightning *direct cutting doubled* on same base of tooth without loss of space.

N.B.—Any M *tooth cutting saw with one point set one way and one the other, is practically equal in cutting to old* V *tooth only.* As slant edge if exposed, will ride and lift out vertical. See demonstration above mentioned.

The American Institute Official Report.

"The Lightning Saws are certainly an improvement in that useful article. Formerly the greatest angle for saw teeth was 60 degrees (or one-sixth of a circle), while in these saws it is 90 degrees (vertical), which gives it a cutting edge instead of a scraping edge, and must necessarily cut much faster than any other saw now in use, and consequently consider them of the highest degree of merit."

Also, Special Medals of 1872, and Special Silver Medal, 1873, awarded over all other Saws to

E. M. BOYNTON, 80 Beekman Street, New York.

Special Notices.

ROLLING MILL.

We have the machinery for a bar mill, which we wish to put in operation at Lockville, Chatham county, North Carolina. Lockville is on the Raleigh and Augusta Air Line Railroad and the Deep River, ten miles below the Egypt Bituminous Coal Fields. The climate is mild and the location desirable. A mill at that place would command all the local trade of the State. A person or persons having a knowledge of the business, and capital sufficient to work it, wanted to take an interest. Inquire of

J. M. HECK, Prest.
Deep River Mfg. Co., Raleigh, N. C.
Or **GEO. G. LOBDELL,**
Wilmington, Del.

A man with over 20 years' experience in the manufacture of Iron, a thorough, practical draughtsman, Civil and Mechanical Engineer, at present in charge of the construction of a blast furnace in the South, will be open to engagement shortly.

Address, *IRON MASTER,*
Office of The Iron Age,
No. 10 Warren Street, N. Y.

Katahdin Charcoal Pig Iron.

O. W. DAVIS, Jr., Manufacturer, **Portland, Me.**

Furnace in Piscataquis County, Me., for Car Wheels, Steam Cylinders, Boiler Plates, Hydraulic Presses, Plows, Chilled Rolls, and any purpose requiring great strength.

South Boston Tests, Katahdin Pig Iron.

No. 2,	density, 7·202;	tensile strength ⅜ square in.,			19,894
No. 3,	" 7·242;	"	"	"	26,928
No. 4,	" 7·236;	"	"	"	30,765

Shipped by rail or water from Bangor or Portland.
Samples and analyses furnished on application.

A. PURVES & SON,

Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for all kinds of **Metals** and **Tools.**

STERLING IRON & RAILWAY CO.

SHIPPERS OF
STERLING MAGNETIC IRON ORE
FOR BLAST AND PUDDLING FURNACES.
A. W. HUMPHREYS, Treas.,
42, PINE ST., N. Y.

To the Trade.

HARDWARE TRADE REGISTER.

1874

Owing to the backward state of trade occasioned by the late panic, we have deemed it advisable to defer the issue of our Trade Register until a later period than usual in order to give its benefits to the trade of next season.

It having come to our knowledge that certain parties, evidently having no reputation of their own, are endeavoring to trade upon our already established reputation, by assimilating our title, and even, in some instances, from what we understand, using our last edition for canvassing purposes, we respectfully anounce to the trade that we are now canvassing for our next edition, which will contain additional features of interest calculated to make it still more valuable than it already is, and render it indispensable as a work of reference to the trade, **and we ask them to withold their advertising favors until our agent may call upon them.**

Please Notice that we always have a printed form, bearing our address 4 & 6 Warren St., for orders for advertisements, and that they are payable only to the order of the Manager.

The Merchants and Manufacturers Agency,
(MERCANTILE.)
No. 14 Park Place, N. Y., Publisher.

CAUTION

No advance payments required for regular advertisements; but **all small matter is payable in advance.** And our only authorized agents to collect money are invariably provided with a certificate of authority, bearing our official seal, and signed by the manager, and are instructed always to give our printed receipt stamped with our seal and countersigned by the party receiving the money.

S. W. THOMPSON, Manager.

TO INVENTORS.

Patents secured in the United States and Europe, on the lowest terms and very

PROMPTLY,

by **A. V. BRIESEN,** Solicitor of Patents and Attorney at Law in Patent Cases,
258 Broadway, N. Y., cor. Warren St.
Consultation gratis.

Wanted.

A young or middle aged, active and energetic partner, with $6000 to $7000 capital, in an old established and well paying retail Hardware business, situated in one of the most thriving towns in Western New York. Satisfactory reasons given. Best of references given and required. Address, **S,**
Office of *THE IRON AGE,* 10 Warren St., N. Y.

BISSELL & CO., AUCTIONEERS.

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The undersigned issues the only extensive Spanish Colonial produce report printed in America, its 161th, April number being the 133d published. It appears simultaneously on *El Cronista* and in *letter sheet form.* Thirty-five order-giving houses of the first-class in the city, are now subscribers to the latter. They forward the same in their correspondence to all Spanish American countries, to Brazil, Spain and Manila, together with a prices current, on which, under a special arrangement, leading ***Hardware, Paint*** and ***Oil*** houses are quoted. The review, although not pretending to be an advertising medium, is thus of great value to the party quoted. A copy with full particulars will be forwarded to manufacturers desirous of thus pushing their interests in South America, etc. Address,

C. KIRCHHOFF,
Commercial Editor "El Cronista,"
Box 2806 P. O., N. Y.

To Mining Companies, Manufacturers and Engineers.

My son has just graduated at the Royal School of Mines, Clausthal, Prussia, and I wish to place him either as an Assayer, Mining Engineer or Draughtsman. His double Diploma as Mining Engineer and Metallurgist is open for inspection.

C. KIRCHHOFF,
Commercial Editor "El Cronista,"
Box 2806, N. Y.

Next July a well known firm of Engineers and Machinery Agents, with large connections at home and abroad, will open a ground floor warehouse, having windows fronting Queen Victoria Street and Cannon Street, City, London, England. The firm is prepared to accept the agency for special machinery, tools, &c., and to exhibit a choice selection of these, and of working models. Advertisers' travelers canvass Great Britain and the whole of Europe. For terms, apply to ***W. P. L.,***
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CHAS. B. SMITH, No. 115 Broad St., N. Y.

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Union Nut Co., 78 Beekman St.; L. Boardman & Son, 82 Chambers St.; Millers Falls Co., 78 Beekman St.; E. M. Boynton, 80 Beekman St.; Yale Lock Mfg. Co., N. Y.

P. S.—Copies of my list will be forwarded to any address throughout the U. S. upon receipt of $3·50.

NEW YORK, February 26, 1874.

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This volume will contain a history of the various branches of the Iron business, from the iron ore regions of the United States to a descriptive directory of the steam engine, machinery, and general iron works of the country. The various blast furnaces, rolling mills, Bessemer and crucible steel works, of the different States are described, with their locality, character, and annual capacity of product. In addition, the locomotive works, car and car wheel works, iron bridge works, pipe works, and iron-ship yards of the country are fully noted. The directory of steam engine and machine works contains a complete enumeration of all the establishments of this kind in the country, including, also, the agricultural, tool, and hardware works and iron founders. The treatise on the iron ore regions gives the locality, character, and extent, with the commercial value of the various iron ores at the different points of development. The latest statistical information as to the iron industry in 1873 is appended, the whole furnishing a valuable work of reference to every branch of the iron trade.

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Sealed Proposals addressed to the Board of Water Commissioners, Atlanta, Ga., indorsed: "Proposals for Furnishing and Delivering Water Pipe," will be received at their office in the city of Atlanta, Ga., until 12 o'clock M., of the 1st day of June, 1874, for furnishing and delivering the following quantities of water pipe and special castings, viz:

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Fifty (50) tons special castings, more or less.

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The right is reserved to reject any or all bids.

By order of the Board.

A. MURPHY, President.
C. L. REDWINE, Secretary.

Atlanta, Ga., April 25, 1874.

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There will be sold with the above a large and valuable collection of Patterns, Heavy Crane Flasks and Heavy Core Spindles for making heavy Castings and Pipes of all sizes; Turning and Planing Tools.

The Works can be put in immediate operation. A favorable opportunity is here presented for enterprising men. The demand for Castings and Machinery is constantly increasing in this region. The property will be sold on liberal terms. ***If not sold in a reasonable time it will be for Rent.***

For particulars apply to
J. W. ROSEBERRY, Trustee,
Pottsville, Pa.

(For balance of For Sale Advertisements see 23d page.)

The Iron Age.

New York, Thursday, May 21, 1874.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . . Editor.
JOHN S. KING . . . . Business Manager.

The Iron Age is published every Thursday morning, at No. 10 Warren Street, New York, on the following terms:

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Weekly Edition.....**$4 a year.**

Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of business on the previous day.

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DAVID WILLIAMS, Publisher,
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CHARLES CHURCHILL & Co., American Merchants, 28 Wilson Street, Finsbury, London, England, will receive subscriptions (all postage prepaid by us) at the following prices in sterling: Great Britain and France, 25/; Germany, Prussia and Belgium, 33/4; Sweden, 50/. They will also accept orders for advertisements, for which they will give prices on application.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*: also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

The Danks Puddler in England.

During the past two years, varying accounts have reached us of the results of the trials of Danks' rotary puddler in the different British ironworks which had adopted it on the recommendation of the committee of the Iron and Steel Institute sent to this country to examine it workings. At first everything promised well for the invention, and the reports were all favorable. After a time we heard of their being thrown out of one mill and then another, although in some mills they were said to be working continuously to the entire satisfaction of the proprietors. The newspapers have had more or less to say upon the subject, though without publishing anything very definite concerning it, but as the rule their recent comments have been generally unfavorable. The first clear and explicit statement concerning the workings of the Danks machines in England comes from Mr. I. Lowthian Bell. In the address delivered by that gentleman at the assembling of the Iron and Steel Institute on the 8th inst., the subject of mechanical puddling is very fully discussed, and from this we learn that the Danks machine, if not a failure, is very far from being a demonstrated success. After noticing in a general way the manner in which the subject had originally come before the Institute, and its action concerning it, he says:

"In all respects, the accounts received from our commissioners were so satisfactory that certain firms made arrangements for giving the system a proper trial in this country. These were: Messrs. Boickow, Vaughan, & Company, Limited, Middlesbrough, who speedily had two experimental furnaces in operation; Messrs. Hopkins, Gilkes, & Company, Limited, by whom has been erected a complete forge, comprising two melting cupolas, twelve revolving furnaces with powerful shingling machine, and a set of three high rolls for reducing the blooms into bars; the Erimus Iron Company, also at Middlesbrough, who have built a complete forge, consisting of twelve furnaces, to which is now being added a finishing mill for working up the product into merchantable iron; the North of England Industrial Iron Company, at their works, near Stockton, erected a forge consisting of eight furnaces with the requisite machinery for obtaining puddled bars; and in addition to these establishments on the Tees, or its neighborhood, Mr. Robert Heath has constructed six furnaces in North Staffordshire. As the preliminary investigation into the merits of the Danks furnace was undertaken at the instance of the Institute itself, I deemed it my duty, in the absence of other communication on the subject, to make some inquiry into what had up to this time been done. I did this in the hope that, when I brought it before you, some gentlemen would avail themselves of the opportunity by stating their opinion of what we might expect from the proposed supersession of the more laborious part of the puddling process by mechanical agency. Speaking generally, then, I may be allowed to observe that at no previous period in the history of the iron trade would this change have been more welcome than during that which intervened between the meeting in 1871, when Mr. Danks read his paper, and the present time. For a considerable portion of it not only have we had the price of labor rising to a point hitherto unknown in the industrial annals of this country, but there was an actual want of the necessary human aid to meet the extraordinary demand made on our malleable iron works for their produce. Within the last few months, however, a great change has taken the place of previous prosperity; but, in a commercial sense, we require, perhaps more urgently than ever, any relief which mechanical puddling can afford in a manufacture which all but, and in some cases, perhaps, has ceased to be profitable, and in which serious difficulties are more than apprehended. I fear, notwithstanding, it must be admitted that the success which has attended the substitution in this country of the new for the old plan of hand puddling has not invariably corresponded with the accounts given us by those gentlemen who reported upon its introduction in the United States. Nevertheless, I would not have it supposed that I am impugning in any degree the soundness of their observations while engaged in their mission. It is quite possible that American iron may offer less difficulties while under treatment in a Danks furnace than that of this country. It is also equally possible that those difficulties which have been encountered in a continuous application of iron, such as that produced in Cleveland, may not have been so apparent when treated in more limited quantities during the comparatively short trials made under the personal superintendence of our Commissioners. Referring, now, more particularly, to the North of England, I have to observe that some alterations have even been found necessary in the moving, as well as in other portions of the machinery. These minor defects, so far as I can learn, have been overcome, and there remains the one great impediment to success, upon which, at Dudlay, so much stress was laid, viz., the durability of the lining of the furnace. Upon this branch of the question, the testimony obtained in the North of England is somewhat conflicting. At one establishment the entire plant, after some months of work, has been laid idle, and preparations are there in progress to alter the furnace to the plan recommended and already described by Mr. Crampton, in a paper read before the Institute. On the other hand, while admitting the existence of difficulties not yet entirely vanquished, the practical men who are directing the trials, express themselves confident of ultimate success. Considerable importance is attached, and fairly so, to the superior yield afforded by mechanical puddling as compared with that performed by manual labor. I would point out, however, that this is secured at a certain sacrifice, for in no case do I find that the large quantity of ore, containing 50 or 60 per cent. of iron, affords above 20; while, on the other hand, a large quantity of additional material has to be maintained for a considerable time at a very high temperature."

This is probably a very correct statement of the results attained up to this time. Mr. Bell certainly manifests no disposition to place any obstacles in the way of the success of efforts now making to overcome the practical difficulties to which he calls attention; but while our knowledge of the results of experiments with the Danks system in American mills is such as to assure us that he has not exaggerated the difficulties experienced in England, we are by no means sure that those efforts will not lead to complete success. Two companies mentioned by Mr. Bell, the Carlton Iron Works, Stockton-on-Tees, and the Erimus Iron Works, near Middlesborough, have undertaken experiments with the Danks system on a very extensive and complete scale, and under the conditions most favorable to success. The managers of these works have faith in the principle of rotary puddling, and are determined to test its possibilities. They have already found it more economical than hand puddling; it has placed them in a position of independence as regards skilled labor in this department of iron manufacture, and the quality of the iron is such as to command £1 per ton over that puddled by hand from the same pig. These are important results, and go far toward showing that, when applied on a large scale, puddling can be done cheaper by machinery than by hand. It cannot be denied, however, that there are offsetting disadvantages which will retard the adoption of the system in small establishments. The cost of the plant is very much greater than that of reverberatory furnaces of the common pattern, and this fact will discourage experiments with the Danks system until its advantages over the old method are established beyond a doubt. Another disadvantage is found in the fact that with a Danks furnace a break-down is a very serious matter. An accident to the squeezers might necessitate the stoppage of an entire establishment for weeks. This happened not long ago at the Carlton Iron Works, and involved very considerable losses to the owners. Again, rolls of exceptional size and power are needed to manipulate such large masses of iron as are produced in the Danks furnace, and the Carlton Works have probably the heaviest and most powerful roll train in the world, which has a sufficient capacity for rolling all the iron produced in the eight furnaces now at work. But should their rolls be disabled from any cause, the mill must stop until they could be put in working order again. The most serious objection to the Danks system, however, is the danger that the large masses of metal thrown into the furnace will destroy the lining, and when this is gone the furnace will soon go with it. Granulation of the iron has been suggested as a means of obviating this danger, and it is probable that some remedy for the evil will be found that will make the complete success of the system possible.

Whether mechanical puddling is likely at any time to supersede the old method of puddling by hand is a question which, even in the light of experience, it would be difficult to answer with confidence. For many years practical men have labored to demonstrate the practicability of rotary puddling, though with but few substantial results. Mr. Danks has come nearer complete success than any of his predecessors—so near, indeed, as to inspire confidence in the belief that all defects in his system will ultimately be remedied. Those who have intelligently studied the theory of rotary puddling admit that it is correct, and when a theory is right its application to practice is, at most, only a question of time. The prejudice in favor of the old reverberatory furnace rests upon nothing except the fact that no better furnace has been found which admits of general application. It is a very crude affair, at best, involving a loss of heat which ought to be utilized in some manner, and exacting from puddlers what is probably the hardest labor voluntarily undertaken by men in any department of manufacturing industry. Its only claim to continued favor is that it involves no great outlay in construction, that it is compact, can be easily repaired and quickly prepared for work. These are advantages certainly, but were rotary or any other form of mechanical puddling brought to a state of even approximate perfection, hand puddling would give way before it. Others are working at the problem with confidence in the possibility of solving it practically, and, should the Danks system fail, our knowledge of the causes of its failure, after such trials as it is now undergoing in England, will, doubtless, point the way to success in the same direction.

The British Navy.

During the past few years the British government have spent a great deal of money in an experiment which, though interesting, has never given much promise of profit. They have tried to maintain an invincible navy of impervious iron clad ships, which should be a credit in time of peace, and a defense against all comers in time of war. For years it has been a race between the artillerists and the naval architects, with varying success. As soon as a ship was built which was believed to be impervious to any projectiles which might be hurled at her, a new gun would be brought out which would riddle her armor, and, under favorable conditions, disable her. It was then necessary to build another ship with heavier armor, and so it has gone until at last a point has been reached in which the gunners have fairly distanced the naval architects, by showing conclusively that impervious armor plating for ships is an impossibility. To continue this contest, and maintain in sea going condition the increasing fleet of old and new ships, has cost an average of $50,000,000 per year, of which about $5,000,000 per year have been spent in construction. The people of Great Britain have "growled" not a little at this heavy expenditure, but they have flattered themselves that they were getting the worth of their money in naval glory, and in the satisfaction of knowing that they were thus maintaining the traditional prestige of the British flag upon the sea. Now, however, with a change in the Admiralty, the facts comes out in justification of a request for an unusually large appropriation, that the British navy is not so strong as the people thought, by a great deal. On paper the fleet includes 55 iron clads, of which 41 are sea going ships and 15 adapted to coast defense; but of the former class five are still on the stocks, with no chance of being completed within the present year; nine are utterly good for nothing, except to break up for old iron; nine are unfit for service, because their boilers are in such a condition that it would not be safe to make steam enough in them to give the ships steerage, and four are now undergoing very thorough and expensive repairs. Of the second class, five are on foreign stations, and are not worth sending for. There remains, then, of iron clads, available in an emergency, only 23 altogether. Beside these, there is a fleet of corvettes, gunboats and transports, which are considered of so little account that they are not counted as a part of the fighting navy.

The publication of these facts has given rise to what in England is called a "scare." The newspapers have begun to speculate upon the interesting question of whether, after all, the "battle of Dorking" may not actually happen in the event of a war with one or more of the great Continental powers. The condition of the navy has been fully considered in Parliament, and some very interesting facts have been brought out. It appears that during the ten years from 1863 to 1873 the government built, of sea-going ships, 226,000 tons, and during that time 215,000 tons were struck off the list of effective vessels, showing a gain of only 16,000 tons in ten years of extraordinary effort to make the navy formidable. During this period the annual rate of depreciation in new vessels is estimated at five per cent., which would make the life of a modern ship of war very much shorter than it used to be in the days of wooden frigates. The rate at which iron clads become obsolete is estimated at 3 per cent. per annum. The most curious and interesting fact concerning vessels of this class is the rapid deterioration of their boilers. Why this should be so no one has yet satisfactorily explained, but the fact remains that two first-class iron clads, built six years ago, are now receiving new boilers, and one built in 1866 required new boilers in 1870. As was shown in the recent debate in the House of Commons, this compares very unfavorably with the record of boilers in the merchant service. The records show that the introduction of improvements in the machinery of the iron clads has only resulted in hastening the deterioration of the boilers, and a committee has been appointed to investigate the subject.

With these facts before us, we are more than ever impressed with the fact that heavy armored ships are still an experiment, and an experiment which promises nothing. The day of great navies is past, and the type of the war vessel of the future has, we think, yet to be designed. A nation's best defense is the patriotism of its people and the wise and liberal statesmanship of its rulers. We have always thought, and still think, that the time is not far distant when the building of great iron batteries will be abandoned as a costly folly, and that small, fast sailing, easily managed ships, with the heaviest armament they can carry safely, will be found more available for both offensive and defensive purposes than the floating monsters upon which the British nation has expended so much money to no purpose. The rules of civilized warfare do not now permit the bombardment of defenseless seaboard cities, and by means of torpedoes ports may be effectually closed against hostile fleets. Moreover, a nation never has anything to protect at sea but its commerce, and our own experience shows that one swift cruiser can sweep the commerce of a nation from the seas, and that the greatest navy afloat could not protect it against privateers. Experience has also shown that no coast of any extent can be effectually blockaded, and great navies will soon be numbered, with walled cities and permanent fortifications, among the things which have been rendered obsolete with the progress of civilization.

The Mill River Disaster.

The recent disaster at the Mill River dam, by which three thriving manufacturing villages were swept away with great loss of life and property, is one of the most startling accidents which we have been called upon to record in a long while. On Saturday morning the Mill River Valley, from the dam to the town of Florence, was one of the most prosporus sections of Massachusetts in proportion to extent and population. Hundreds of substantial dwellings and manufactories attested the enterprise and wealth of the people. In a moment the rush of a torrent swept away two hundred persons unconscious of danger until escape was impossible, and property worth at least a million of dollars. Most of the factories and the greater part of the dwellings were carried away by the flood, happiness has given place to universal mourning for the dead, and rich and poor alike are dependent upon charity for the means of subsistence. A week ago it would have been difficult to find a community more prosperous and happy: to-day it would be difficult to find one more impoverished and grief stricken.

To what extent this terrible calamity is due to causes which might have been guarded against, can only be determined by the investigation which will doubtless be instituted. The testimony is conflicting as to whether the dam was properly built in the first place, and whether it was or was not believed to be strong enough to hold the great body of water confined by it. If a niggardly economy on the part of the owners of the dam, in neglecting to strengthen it after a suspicion of its strength was aroused, permitted a calamity which might have been averted, those who are responsible should be visited with the heaviest penalties imposed by the law for gross carelessness resulting in loss of life. With only the statements of news gatherers and correspondents, written in a time of intense excitement, to guide us in forming an opinion, we have none to express on the subject. The first and only immediate lesson to be learned from the terrible calamity is the necessity for looking after dams of this character, especially at this season. Such structures should be frequently inspected by expert and disinterested engineers, and companies chartered for the construction of such works should be held accountable for any loss of property resulting from causes against which they might have guarded. Loss of life is something for which no compensation can be made, but loss of life seldom occurs from the bursting of dams without destruction of property, and when we make companies owning water powers responsible, pecuniarily, for property damaged or destroyed, they will take care that their dams are strong enough to resist the pressure of any body of water that may flow into or over them. In matters of this kind there should be no divided responsibility and no "limited liability."

The poor people who have lost everything but life by this disaster are certainly objects of sympaty, and the quick and generous response which has been made to the appeals for aid in their behalf is creditable to the business community.

Foreign Commerce of New York.

The statistics of our foreign commerce for the month of April and the four months ended therewith, show a falling off in both imports and exports. The importations amount to $149,114,698, against $157,284,255 for the first four months of 1873, and $159,547,844 for the corresponding period of 1872. The movement is shown in detail as follows:

FOREIGN IMPORTS AT NEW YORK FOR THE FOUR MONTHS FROM JAN. 1.

	1872.	1873.	1874.
Ent. for con	$82,616,870	$71,375,103	$63,815,578
Ditto for warehousing	65,371,388	48,105,657	41,968,991
Free goods	10,921,755	36,158,662	42,062,465
Spec. and bullion	637,831	1,644,833	1,267,664
Tot. ent. at port	$159,547,844	$157,284,255	$149,114,698
Withdr'wn fr'm warehouse	46,268,490	44,063,091	41,080,161

The exports of the past four months, as compared with the corresponding periods of 1873 and 1872, are:

EXPORTS FROM NEW YORK TO FOREIGN PORTS FOR FOUR MONTHS FROM JANUARY 1.

	1872.	1873.	1874.
Domestic produce	$66,647,319	$85,423,164	$87,108,401
For. free goods	544,846	926,751	701,913
do dutiable	3,293,811	2,441,614	2,581,449
Specie and bullion	9,726,141	18,219,705	10,646,197
Total exports	$80,212,117	107,011,234	101,037,960
Total exports, exclusive of specie	70,485,986	88,791,529	90,391,763

The following tables show the imports and exports at this port for the first ten months of the fiscal year ending April 30th, 1874:

FOREIGN IMPORTS AT NEW YORK FOR TEN MONTHS OF THE FISCAL YEAR.

	1872.	1873.	1874.
Six months	$183,028,276	$199,326,050	$177,517,854
January	35,679,496	37,803,691	30,310,679
February	38,206,143	38,860,517	35,439,646
March	39,218,268	43,440,621	42,599,446
April	46,443,937	37,179,426	40,764,927
Tot. for 10 mos.	$342,576,120	$356,610,305	$326,632,552
Deduct specie	2,244,387	6,461,463	17,081,570
Total mdse	$340,331,733	$350,148,842	$309,550,982

EXPORTS (EXCLUSIVE OF SPECIE) FROM NEW YORK TO FOREIGN PORTS FOR TEN MONTHS OF THE FISCAL YEAR.

	1872.	1873.	1874.
Six months ending Jan. 1	$119,604,290	$130,400,814	$160,757,524
January	18,951,004	20,050,550	23,455,638
February	17,915,169	21,139,002	20,725,611
March	16,530,019	21,982,209	22,909,218
April	17,089,784	25,619,768	25,301,296
Total product	$190,090,266	$219,192,343	$251,149,287
Add specie	32,037,065	53,063,848	31,486,574
Total exports	$222,127,331	$272,256,191	$282,635,861

These latter show a falling off in imports, a gain in exports of merchandise, and a falling off in specie exports, as compared with 1873 and 1872.

The steamboat owners have won their fight in the House of Representatives, but they have before them the prospect of a tough struggle in the Senate. The steamboat inspection law of 1870 saddled upon the steamboatmen a number of patented contrivances of which none were better than many which could have been had at smaller cost, and few as good. These they were required to purchase at the manufacturers' prices and use upon their boats, in order to obtain certificates of proper equipment, without which they could not carry passengers. As an instance of the gross injustice done them, we may mention a fact which deserves to be remembered. The law required that cork life preserving jackets should be provided, and the West-

ern inspectors agreed that no life preservers should be approved in which the cork was not visible. This was all right in appearance, but it was soon discovered that the object of this rule was to make a market for a life preserver identical with those in common use, with the exception of a hole in the canvass covering to show the cork inside, on which some enterprising manufacturer had obtained a patent. Unfortunately for the steamboatmen, the amendments to the law of 1870, which passed the House a few days ago, are vigorously opposed by a very strong combination, including the railroadmen who naturally wish to place all the obstacles they can in the way of steamboating, the inspectors, and those interested in the patents before mentioned. The fact that the steamboat owners have carried their point against this opposition in the House should encourage them to make an equally vigorous effort in the Senate. The only way to diminish the dangers of river navigation without injury to a very important interest, is to hold the owners of steamboats to a strick account for carelessness or neglect of proper precautions for safety, and then leave them free to act according to their judgment as regards the means to be adopted. The more closely one's duty is defined by law, the less the sense of personal responsibility and personal obligation, so long as the letter of the law is observed. What we need, is that the responsibility for life and property should be fixed where it belongs, and when this is done steamboat owners and railroad managers will find the means of making travel by rail and water safer than it is now.

On Saturday last fifteen steamers left this harbor for foreign ports, mostly with full cargoes and passenger lists, especially those for Europe. Not many years ago the announcement of the departure of one steamer would have brought a crowd of spectators to the Battery to witness the sight, which is now a matter of such common occurrence as scarcely to attract notice. We venture the opinion, however, that such a sight as may be seen every Saturday in the bay between the hours of noon and 3 p. m., is rarely witnessed in any part of the world. So animated a spectacle, with such picturesque surroundings, cannot fail to interest anyone who will take the trouble to see it. But while justly proud of our commercial pre-eminence, it is humiliating to think that in this great fleet of ocean steamers our flag is so poorly represented. So far as we know, but one steamer built and owned in this country, sailed from here on Saturday for a foreign port—the City of Panama, for Aspinwall.

Mr. Charles J. Nourse, Chairman of the Pig Iron Committee of the American Iron and Steel Association, has called a meeting of pig iron manufacturers, to be held on Thursday morning, the 28th inst., at the rooms of the association, No. 265 South 4th street, Philadelphia, to consider subjects of interest to the iron trade. It is expected that the meeting will urge decisive action by Congress on the financial question, and on the proposition to restore the ten per cent. duty taken off by the act of 1872. The call has been approved by the leading iron manufacturers.

IRON TRUSS BRIDGES.

Comparison of the American and European Systems and Methods of Construction.*

BY CHARLES BENDER, C. E.

The progress of the manufacture of iron and of mechanical and railroad engineering within a small number of years has resulted in the development of the numerous systems of bridges which are now used. It was necessity that gave the great impulse in this direction, and though nearly all of the general systems and also quite a number of essential details used in the present structures had been used, or, at least, been recommended by earlier writers, yet their ideas had to be reinvented, Europe and America interchanging their improvements.

At the beginning of wrought iron bridge building, Europe, not far enough advanced for the correct construction of iron arch bridges, turned her eyes to the wooden trusses developed meanwhile by the Americans, and proceeded to build the systems of Town, Long, Pratt and Howe in iron, while America continued until lately to use wooden bridges almost exclusively for her great net of railways.

And when the necessity had arrived to replace these perishable wooden structures by durable iron bridges, America had the opportunity of using the experience and a number of essential details which, meanwhile, had been tried by European practice.

In the selection of these details, and in their application to their wants, the American engineers have shown a great deal of practical tact; and within a few years they have produced a system which by appearance, by simplicity, solidity and economy is favorably distinguished from the system used in Europe.

This, with most of its details, has been worked out in England, where the abundance of cheap material has inclined it to a system in which can readily be recognized the principle to build exclusively of angles and plates, and, if possible, to use the rolled bars in the same shape as furnished by the mills. The Americans have not limited themselves by such a rule, but are governed by the broader business principle, to apply that construction by which the technical purpose can be carried out with the least quantity of total labor, all factors being considered.

It is made the subject of the present paper to show how they have done this, and by what proportions and in what details their designs differ from European arrangements.

Of course, reference is made only to those structures which leading American firms, with almost congruous details, are in the habit of erecting, whose study would soon disperse those prejudices which have been created in Europe on account of disasters which were caused by insufficiently experienced builders. Similar disasters have also happened in Europe, and their number was less, not on account of the superiority of her systems, but principally on account of the strict governmental supervision, which in the United States, on account of her public institutions, has not been introduced.

The differences between the two systems can be found to consist in the degree of excellency of the applied general arrangement; in the use of the proper proportions between length and depth of span and the length of panels; in the form, character and strains of the applied metal; in the mode of forming connections; in the application of castings, and in the manner of erection.

Each of these points in the following will receive some consideration.

The general systems of American truss bridges, when compared with those used in Europe, are striking by their simplicity. It may be said that of all the different forms there are two which excel all others, and are bound to be used exclusively in the future. These trusses have parallel chords, and either vertical or inclined web posts. The trusses with vertical posts and inclined tie-bars are called "Pratt or Whipple" trusses, and may have vertical or inclined end posts, and single, double, or more fold intersections of diagonals. The others are Neville or Warren trusses, posts and diagonals being inclined either at equal angels, or the posts may be inclined differently from the ties. In point of economy, when all circumstances are fairly considered, the quadrangular or Pratt truss seems to afford the greatest advantages, from the reasons that it can be built higher, that it can be manufactured and erected somewhat more easily, and that the cross bearers can be more substantially attached to the posts than is the case when the posts are inclined.

Since these truss bridges are built so that each tensile member can articulate around the theoretical points of intersection of the center lines, the suppositions of the theory are almost strictly carried out. This is not the case with the European riveted structures, for each part of these bridges will receive a moment of flexure at the points of connection, and the theoretical center lines mostly do not intersect in one point, around which free turning motions should take place. Though it is possible to prove that these moments of flexure are not large when compared with the total moment of the bridge, they nevertheless will affect the rivet connections and add strains in certain points, which accumulate to 30 per cent. and more of the calculated strains. This is a very considerable increase, equivalent to an addition to the load of 30 per cent. The effect of this and other irregularities probably can only be shown after the use of such structures during a greater number of years, and will certainly shorten their lifetime. The simple American structures are free from such objection.

Again, the majority of European bridges are built on the now antiquated lattice plan, according to which all systems of diagonals are connected with each other by rivets at the points of intersection. Of course, it is totally impossible to calculate with any degree of correctness the strain in any of these members, nor is it possible to state what is the exact strain in a chord, because the web system takes up a part of the moments. The American structures mentioned, on the contrary, are arranged in such a manner that each system of ties and posts is totally independent of the other. This is strictly true for single triangular trusses and for quadrangular trusses with vertical end posts, while for Pratt trusses, with a double system of diagonals and posts and with inclined end posts, the connection of both systems takes place only at the end top joints, where the influence of this deviation is less than that caused by the value of one panel load divided by the number of panels of the bridge.

These being the differences concerning the general systems of European truss bridges when constructed with parallel chords and open web systems, there are still very great points in favor of the general systems of American bridges when compared with European trusses with chords not parallel, not to speak of the antiquated tubular or the plate bridges.

Let us compare for a moment the action of a parabolic girder with that of a truss with parallel chords. The web of a parabolic girder under full load is inactive, and its office must be done by the curved chords, while the web of a Neville or of a Pratt truss under uniform and full load is almost fully in action. The parabolic girder is arranged so that only under a certain condition is the web active. The maxima web strains are but small, and this must lead to a considerable amount of web metal when compared with its office.

The trusses with parallel chords lose a comparatively far smaller amount of metal in the web systems. The parabolic truss, or any other with curved chords, loses always a considerable amount of the material by the increase of the chord sections, and this loss is not made good by saving in the web. Professor Culmann, in Zurich, has proved theoretically that there is a remarkable difference in favor of the trusses with parallel chords, and experienced practical bridge builders will indorse his result. For a large span with one curved chord, under the supposition of proper lateral bracing in top and bottom surfaces, the difference in cost and value may not be so very great, because it is easier to build the web system without material loss of metal, though extra cost of workmanship and an additional quantity of chord material must still be expected; but when we turn to analyze trusses with two curved chords, or with but one lateral bracing in the bottom floor, we will have to do with structures far inferior to any good truss with parallel chords. This is the fact, from three reasons: namely, because of the increased difficulty of manufacture; then from the necessity of forming a straight floor surface, which can only be accomplished by another addition of metal; and finally, because of the deficiency of lateral stiffness of the top chords.

Curved top chords without lateral connections must be considered as pillars, being as long as the whole span, which can bend out laterally.

These chords consequently should be very wide and stiff, and should contain more material than is generally the case. The stiffening knees, which in most cases are attached to cross bearers and posts, are expensive, and their efficiency can merely be guessed at. Such a top chord should always be built continuously. The parabolic or similarly formed chords without proper lateral bracing are, therefore, of inferior strength when compared with straight and parallel chords; they require more iron, and their workmanship is more expensive and less trustworthy.

Bridges with curved top and bottom chords of course are still less economical, since also a straight floor will have to be formed, with the expense of material and labor.

When the great expense connected with such structures has been proved, their alleged beautiful lines are generally recommended. But how can a structure be called beautiful if, as is the case with the bridge across the Elbe River at Hamburg, it is obvious that its arrangements are not appropriate to the wants, while even professional men cannot detect any sufficient reason to warrant the deviation from approved and simpler forms?

In order to give an example to show that no material is gained by the adoption of curved chords, a bridge across the Brahe River in Prussia can be mentioned. It is a bow-string truss, 81 feet long and 10 feet deep, praised as being very light, with 752 pounds per lineal foot, while a through Pratt truss for the same rolling load could have been built more than 20 per cent. lighter, causing considerably less labor for manufacture and erection.

As another example for comparison, the 210 foot trusses with curved top-chords of the Elbe bridge on the Berlin-Lehrte Railroad may be quoted. It is a double track bridge designed for a rolling load of 2450 pounds per lineal foot of track, the strain being 11,000 pounds per square inch of section. The iron of this structure (depth of truss being one-seventh of the the span) weighed 1360 pounds per lineal foot, so that a single track bridge would have had about 1570 pounds per foot.

The Pratt trusses of over 200 feet on the Grand Trunk Railway, of Canada, built by the Phœnixville Bridge Works, are designed for 3000 pounds per lineal foot, are strained in the average to only about 9000 pounds per square inch, and weigh over 25 per cent. less than the much weaker Elbe bridge. Certainly there must exist valuable advantages in favor of this bridge built by American engineers, which have induced the Canadian government to introduce this style of structure on their road.

Finally, when we consider how slow and tedious is the calculation and the designing of bridges with curved chords, while the calculation of forces, sections, weights and price of an American bridge requires but some hours, and the designing part only a few days, we shall arrive at the conclusion that the few principles of the theory form by far the least part of the knowledge of a bridge builder, but that it is far more difficult to design proper details and become familiar with the amount of labor, with the weights, prices and other experience. It requires many years to study the material, detail arrangements and the erection of bridges, but it takes only about as many days to learn the really valuable points of the theory of the general arrangement of bridges.

Now a few words more must be added concerning continuous bridges.

These are still favored by many Eurepean engineers, who hope thereby to save a part of the material.

The writer of these lines himself had for some time thought that it might be possible, by application of pin joints, by reducing the number of parts, by the use of proper scales and adjustments for the regulation of the pressures on the three or more piers of a continuous bridge, and by the use of scientifically correct and complete formulæ, to produce reliable continuous trusses, by means of which the large rivers of this country could be spanned without the use of false works.

The writer, with a great deal of labor, had constructed an analytical expression, which embraced the relation of the moments of flexure over three consecutive piers of a continuous girder. In this formula due attention was given not only to the deflections caused by the chords, but also to those due to the tensile and compressive members of the web system. In this formula was introduced the actual section of each separate member. It therefore did away with two errors of the formulæ generally quoted in books, which are only applicable when the girders are very shallow and when the web is a plate, and which even under those suppositions do *not* coincide very satisfactorily with experiments.

Notwithstanding the theoretical improvements mentioned, it was finally found that the labor spent in finding said formula had been in vain, from a reason which in Europe, as far as known, has not received any consideration. It is the great variability of the modulus of elasticity, which in the formulæ of the books is supposed to be a constant value of about 25,000,000 pounds per square inch.

But the writer has tested during his presence at the Phœnix Iron Works many thousands of eye-bars, made for actual use in bridges, and he has found that the modulus of these members is very changeable, namely from 18,000,000 to over 40,000,000 pounds per square inch, so that small sections give the lowest and large sections the greatest figures. The same result was obtained by the Canadian engineer, who inspected the iron for the International Bridge near Buffalo, as well as by Mr. B. Nicholson, who was sent to Phœnixville by the government officers of the United States to inspect the iron for the Mississippi bridge at Rock Island.

The figures obtained for bars of the same section and lot, however, were remarkably uniform.

This result proves that to the objections against continuous girder bridges one must be added which cannot be overcome by calculation, nor by manufacture, and that consequently the strains of such bridges are always uncertain, if at least the same section is not used throughout the whole bridge.

Of course the modulus of riveted work is still less reliable than that of eye-bars, and thus we see that the supposition of a uniform modulus of elasticity on which the whole edifice of the extended theory of continuous girders is built, must be considered as utterly incorrect, and the conclusions drawn from such suppositions must be refused.

Moreover no material is gained by the principle of continuity when large spans are built high enough, for in this case whatever material can be saved in the chords will be entirely lost in the web system, while small spans should not be crossed by continuous bridges at all.

The same result will be obtained when we compare the weights of well built European continuous bridges with the weights of large single spans designed on the American plan.

For this purpose the dimensions and weights of the great Russian bridge over the Dnieper River at Krementszug may be quoted. This structure consists of a number of double track continuous lattice girders over pairs of openings of 387 feet each, and was designed by Professor Sternberg, of Karlsruhe, in Germany, for a rolling load of 2660 pounds per lineal foot of track, and for strains of 9800 pounds per square inch, both tensile and compressive. The iron work of this bridge, being one of the finest specimens of the kind, and designed with the greatest possible economy, weighs 2300 pounds per foot and track, so that a single track bridge would have weighed at least 2700 pounds per foot. An experienced bridge engineer knows that he can obtain with single pan trusses equally small weights under application of the American system of bridging, the life loads and the tensional strains being the same as in the Krementszug bridge, while the compressible strains are varied according to the length and diameter.

We now proceed to the consideration of the proportions of length of span to depth of truss, and of the lengths of panels.

Until lately almost all European bridges were arranged very shallow. The plate girders and tubular girders were the lowest, the lattice bridges followed in hight, and by degrees were arranged simpler and also higher. The firm of Kramer & Klett, in Nuremberg, who had improved on the fish-belly or Laves-Pauly truss nearly as far as was possible under application of riveted connections, could use the greatest depths, and could apply at the bridge of Mainz a standard of good proportions which, as far as known to the writer, for such spans and such purposes has not been surpassed.

On the whole, however, American engineers build their trusses deeper, and they can afford to do so, simply because they use better forms of compressional and tensional members, and therefore are not limited in hight of web by rapid increase of its weights, much as is the case under application of the lattice plan.

In close connection with the depth stands the length of panels, which also in Europe on the average are made shorter.

The Kuilemburg bridge has panels of 13½ feet, the Rhine bridge at Manheim has already panels of 15 feet. This is a good length, but has been surpassed already in America by building quadrangular trusses with panels of 17 to 20 feet.

It is plain that by such an arrangement the number of parts is diminished and workmanship is reduced, while at the same time the weights of cross-bearers and stringers are increased.

But this is a great advantage for these long beams not only are more elastic, but also are heavy, and bring more material in the right place, namely, where it will be directly opposed to the life load.

The greater depths of American trusses diminish the deflections, which by General Morin are fixed between the limits of 1-600 to 1-800 of the span, while American practice has reduced them to just about one-half of these amounts.

The longer panels of well built American bridges, and the great cubic contents of heavy and long track ties and guard rails arranged in connection with such floors, certainly remove any objection which could be derived from a high degree of vertical stiffness, while the small deflection, on the other hand, will reduce additional strains arising from centrifugal force, if the proper camber of the floor should not have been obtained. A few examples of the influence of great speed on deflections, and, therefore, also on the strains of bridges, may find a place here.

The Rhine bridge at Mainz has spans of 344 feet, the depth being 1-7 of the length.

A freight train of 296 tons, under a speed of four miles an hour, caused a deflection of 1·931 inches; speed of 25 miles an hour caused a deflection of 1·988 inches.

Therefore, the increase of strain by the increase in speed amounted to 2½ per cent., while the Cologne Bridge over the Rhine River, with a depth of 1-11·6 of the span, showed an increase of 3½ per cent., and would have had 4¼ per cent. if it were not constructed on the continuous plan.

Some spans of the bridges on the Cologne-Giessen Railroad showed increases of strains and deflections equal to 8 per cent., when the trains passed at high speed, over those strains and deflections obtained by the same but static loads.

An article in the *Annales des ponts et Chaussées* of the year 1861 fixes the increase of strains due to increased deflections under quick passing loads to 10 per cent., while for well-designed deep American structures an increase not exceeding that of the Mainz Bridge can justly be expected.

The immediate action of the engine and cars on the iron can be counteracted very effectively and very economically by placing long and heavy wooden ties and guard rails between rails and bridge, and this wood by its great volume and small modulus of elasticity is the proper material to answer the purpose of checking the consequences of a derailment.

The mode of neutralizing the effect of impacts on well-designed American iron bridges, therefore, consists especially in the *proper design in general*, while English engineers have suggested and have used for this purpose heavy ballast of stone and gravel, and lately endeavor to excuse the waste of material of their system on the same score.

If we need stronger bridges than those which are built at present, this task must be accomplished by the use of the most rational and most economical system in combination with a moving load greater than that specified at present, but certainly not by reducing the strength of the structure under the load of waste metal.

The effect of this kind of medicine would be precisely the same as that of building the bridge on the safest and most economical plan, but of finally putting the material saved on the bridge floor, say, in the shape of scrap iron, and this method would still have that preference over the one recommended by some English engineers of being the cheaper of the two.

In comparing European with American bridges, differences are met with in regard to class of material, its sections and strains, as well as with reference to the supposed movable loads.

In both systems preferably wrought iron is used. The application of cast iron in Europe at present is confined to bed-plates and ornaments, while good practice in the United States permits its use for short chords of very heavy spans and for joint-boxes of wrought iron bridges. The justification of this practice rests on the undeniable merits, for certain purposes, of this metal, as well as on the excellent qualities of the cast iron which can be secured in the United States, and on the high degree of perfection to which its working has been brought. Indeed, in principle there is no reason why short cast iron joint-boxes of proper proportions should not be used, since we know that the lives of thousands of people daily depend on the safety of castings constituting the principal details of all sorts of machinery, and which in part have to stand the most severe impacts. In Europe there exist numbers of good brands of cast iron of sufficiently good quality to be used in bridges, and the disasters which have happened there from cast iron structures were rather due to bad design than to faults in the material.

Especially since the breaking down of a Howe Bridge in Austria, built on the Schifkorn patent, Continental engineers seem to condemn cast iron completely, and to consider this material as a half-finished product, which, in their opinion, should not enter into the construction of a first-class railway bridge. However, it should be borne in mind that hardly a more improper use could be made of that material than the one intended by the Austrian engineer mentioned. Short joint-boxes, in structures of experienced American engineers, are better designed and of sufficient thickness of metal.

Concerning wrought iron for tensile members, trustworthy European works use a metal of about the same tensile strength as that selected by responsible American firms.

The average of a great number of tests on iron intended for use in a great Russian bridge, manufactured in Belgium, is contained in the subsequent figures:

Horizontal chord-plates, tensile strength	52,400 lbs.	extension	7 per ct.
Vertical chord-plates	51,700 "	"	6·15 "
Cover or joint-plates	55,700 "	"	5 "
Lateral wind-bars	49,600 "	"	5·6 "
Angle iron	60,200 "	"	11 "
Tensile diagonals	51,800 "	"	17 "
Shearing strength of rivets (single row)	48,300		

A few figures, determined by M. Morin for French iron are the following:

Angle iron from Hayange on the average	56,000 lbs.	per sq. in.
Flat	52,000 "	"
Angle iron from Ars sur Moselle	46,000 "	"
Double T iron	54,000 "	"
Flat iron	54,300 "	"

Again, for German iron the following figures were obtained by Mr. Wœhler from iron furnished to the Mærkish-Silesian Railway:

	lbs.	Strain on ultimate section.	Extension.
Phœnix Co. in Ruhrort axle iron	48,400	68,000	18 per ct.
Phœnix Co. in Ruhrort axle iron	49,500	73,400	12 "
Round iron from Koenigshuette	66,100	100,000	7 "
Round iron from Koenigshuette	56,300	92,000	21 "
Rivet iron from Borsig, in Berlin	76,000	107,000	22 "
Rivet iron from Borsig, in Berlin	78,100	106,000	24 "

(To be continued.)

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Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, May 20, 1874.

Wall street, during the past week, has experienced an unusual dullness, amounting almost to stagnation in the several financial markets. Congress has made absolutely no progress toward reaching a solution of the currency question, but as Mr. Grant has said pretty plainly what kind of a bill he would approve, and what kind he would veto, it is not unlikely that Congress will make its financial policy conform to that of the President. It is useless to speculate on the subject, however. The money market, owing to the small number of borrowers, has been very easy, with rates on call loans ranging from 1 to 4 per cent. There is but little commercial paper offering, and that little, if choice, is freely bought at 5 @ 6 per cent.

The gold market has been steady and quiet, and the premium has ruled low, with unimportant fluctuations. The following are the daily extremes:

	Highest.	Lowest.
Thursday	112⅛	112
Friday	112⅛	112⅛
Saturday	112⅛	112
Monday	112⅛	112⅛
Tuesday	112⅛	112
Wednesday	112⅛	112⅛

The stock market has been very heavy for speculative shares. The speculators have pretty much all turned bears, and the purchases have mostly been made by outsiders who have taken advantage of the opportunity to operate in a small way. The principal dealings have been in Western Union, Lake Shore, Union Pacific, St. Paul, Pacific Mail and Wabash.

Government bonds have been quite steady, fluctuating only in sympathy with gold. Railroad mortgages are lower.

The movements in foreign trade for the week are shown as follows:

IMPORTS.

	1872.	1873.	1874.
Total for week	$10,793,826	$7,938,263	$7,523,869
Prev. reported	163,318,821	163,225,177	151,226,213
Since Jan. 1	$174,112,647	$171,163,440	$158,750,082

Included in the imports of general merchandise for the week are:

	Quant.	Value.
Anvils	70	$800
Brass goods	12	1,284
Bismuth	2	1,949
Bronzes	27	3,394
Chains and anchors	46	2,019
Copper		790
Cutlery	65	22,906
Guns	9	3,362
Gun barrel moulds	40	1,185
Hardware	33	3,850
Iron pig, tons	640	15,246
" R. R. bars	8,180	164,432
" cotton ties	120	1,628
" other, tons	70	8,166
Lead, pigs	8,895	55,483
Metal goods	106	16,476
Nails	7	253
Needles	11	4 816
Old metal		378
Platina ware	2	291
Per caps	1	163
Saddlery	5	735
Steel	4,046	23,143
Silverware	4	753
Tin, boxes	23,582	184,382
Tin, 4,192 slabs	244,856	49,735
Wire	10	1,531
Zinc	1,100	71

EXPORTS EXCLUSIVE OF SPECIE.

	1872.	1873.	1874.
For the week	$3,741,808	$5,482,894	$6,604,654
Prev. reported	77,159,135	100,640,538	100,700,204
Since Jan 1	$80,900,943	$106,123,432	$107,304,858

EXPORTS OF SPECIE.

Total for the week	$5,193,400
Previously reported	10,812,282
Total since January 1, 1874	$16,005,682
" " " 1873	19,128,807
" " " 1872	14,827,433

The following is a comparison of the bank averages of the past two weeks:

	May 9.	May 16.	Differences.
Loans	$286,503,500	$284,587,500	Dec. $1,916,100
Specie	27,305,500	27,300,600	Dec. 2,900
L'g. Ten.	55,798,000	57,100,300	Inc. 1,302,300
Deposits	236,236,700	236,395,000	Inc. 158,300
Circ'lation	26,922,200	26,923,900	Inc. 1,700

Government bonds closed at the following quotations:

	Bid.	Asked
U. S. Currency 6s	116¾	117
U. S. 6s 1881, reg	119¾	119⅞
U. S. 6s. 1881, con	121⅜	121⅞
U. S. 1862, 5-20 reg	115	115⅛
U. S. 5-20 1862, con	115⅛	115⅜
U. S. 5-20 1864, reg	116⅜	117
U. S. 5-20 1864, con	117	117⅜
U. S. 5-20 1865, reg	116¾	117
U. S. 5-20 1865, con	117⅞	118⅛
U. S. 5-20 1865, reg. new	119⅛	119⅜
U. S. 5-20 1865, con	119⅜	119⅝
U. S. 5-20 1867, reg	119⅜	119⅞
U. S. 5-20 1867, con	120⅛	120⅜
U. S. 5-20 1868, reg	119⅜	120
U. S. 5-20 1868, con	120⅜	120⅝
U. S. 10-40 reg	114¾	115
U. S. 10 40 con	114⅞	115⅛
U. S. 5s 1881 reg	115⅛	115⅜
U. S. 5s 1881 con	115⅜	115¾

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	97¾	96¾
Lake Shore	75⅜	74¾
Rock Island	96¾	95¾
Wabash	36⅞	35⅞
Western Union Telegraph	71⅜	70⅛
Northwestern	41¾	40¾
Milwaukee & St. Paul	33⅞	32⅜
do. do. Preferred	51⅝	51
Pacific Mail	42⅝	42
Ohio & Mississippi	23¾	23
Union Pacific	27⅜	26⅜
C. C. & Ind. Central	19¾	19
Atlantic and Pacific Preferred	13¾	13¼

GENERAL HARDWARE.

About the general features of trade there is little to say. The gradual decline in business noticed for some weeks still continues, and trade is now almost universally dull.

Our readers must all have by this time heard of the terrible calamity by which so many factories and dwellings, with many of their occupants, were swept away on Saturday last in Massachusetts. Among the manufacturing establishments destroyed was that of the old and well known house of Hayden, Gere & Co. The trade will be glad to learn that, although the loss is very severe, the firm are abundantly able to bear it, and will immediately begin the erection of new works. Temporary shops will be in operation by Saturday of this week. The stock in their New York warehouse was so complete that hardly any delay will occur in filling orders.

Trade in Foreign Hardware participates in the prevailing dullness. Prices, in the absence of transactions of any magnitude, are without change. We announce with regret the death, in London, England, on Sunday last, of John V. Beam, Jr., senior partner in the well known importing house of Beam & Murray, of this city.

There is nothing new to be said concerning the Nail market. We hear of a fair amount of business, with little if any improvement in the matter of prices. Nails are variously quoted at from $3·90 to $4, net, for 10d. in small lots. It is pretty generally understood that the former figure can be shaded for a large order.

The Millers Falls Co., No 78 Beekman street, have ready to issue a revised catalogue and price list of their goods. The following are the new goods added:

Barber Ratchet Brace.

	Per doz.
No. 31	$39·00
" 32	36·00
" 33	33·00

Discount 40&5 per cent.

Bracket Saws.

Best Spring Steel, with Rosewood Handle.

8 inch	each, $1·10
10 "	" 1·20
12 "	" 1·30
14 "	" 1·40

Discount 25 per cent.

Bracket Saws, with Wood Frames, Cherry, Highly Polished, with Wrought Iron Clamps for Holding Saw.

8 inch	each, $0·80
10 "	" 0·90
12 "	" 1·00
14 "	" 1·10

Discount 50 per cent.

Iron Cutters.

Weight.	Cuts.	Price.
No. 1, 16 lbs.	⅜x2 in., or ⅛ in. round or sq.	$25·00
No. 2, 165 lbs.	⅝x3 in., or ⅜ in. " "	50·00
No. 3, 312 lbs.	6-8x4 in., or 4-4 in. " "	75·00

Discount 33⅓ per cent.

Millers Falls Breast Drill ..... per doz., $30

Discount 25 per cent.

Patent Adjustable Vise Jaws.

These Jaws are made of steel, and will fit any of our Vises from 2½ to 4 inches. We make two sizes.
No. 1 fits 2½ and 3 inch Vise. Price, $1·75 each.
No. 2 " 3½ " 4 " " " 2·00 "

Discount 25 per cent.

This Company, in a patent suit for infringement on Braces, received the favorable decision of the Circuit Court, at New Haven, Conn., week before last.

The manufacturers of Strap and T Hinges held a meeting in Pittsburgh, on the 14th inst., and adopted the following prices for these goods:

We, the undersigned, manufacturers of Strap and T Hinges, do hereby fix the circular price of Strap and T Hinges at 20 and 10 per cent. discount from standard list, and the time of payment at 30 days from date of invoice.

Parties whose orders for Strap and T Hinges, between May 14 and December 31, 1874, amount, at our circular price, to $250 or over, net, will be entitled to an extra 5 per cent. discount.

Roy & Co.
Stanley Works.
E. W. Gilmore & Co.
Wheeling Hinge Co.
Lewis, Oliver & Phillips.
C. Hagar & Brother.

Stanley Works have issued under date of the 14th inst. the following discount sheet, changes being marked with a star (*):

Catalogue pages.		Discount per cent.
4 and 5,	*Bronzed Capped Butts	45
Supp't.	Bronzed Loose Jn't Butts with Ac'ns.	10
Supp't.	Bronzed Loose J nt Butts, no Ac'ns.	15
8 to 12,	Bronzed Narrow Butts, etc.	15
11,	Bronzed Light Inside Blind Butts, "Stanley's"	15
6 and 7,	Bronzed Parliament Butts	10
15,	Bronzed Barrel Bolts	30
13 to 15,	Bronzed Flush Bolts	20
15,	Bronzing Screws	20
67,	Bolts, Chain	40
68,	Bolts, B. K. Shutter	40
66,	Bolts, Cottage, Cast	60&10
68,	Bolts, Hotel Chamber	35
56,	Bolts, Wt. Bar'l, B. K. New List.	50&10
56,	Bolts, Wt. Bar'l, T. K. New List.	
56,	Bolts, Wt. Bar'l, P. K. New List.	
Supp't.	Bolts, Wt. Barrel, B. K. Light, New List	
57,	Bolts, Wrought Brass Barrel	35
57,	Bolts, Wt. Brass Bar'l Tin'd Bolts	
73,	Bolts, Wt. Barrel, Brass Plated	
65,	Bolts, Canada, Por. and Min. Jap'd.	45&5
65,	Bolts, Canada, Por. & Min. Plt'd	50&5
55,	Bolts, Wt. Flat, (Steel Spring)	30
Supp't.	Bolts, Wt. Flat, (Steel Spring)	
55,	Bolts, Wrought Flat Tail	20
60 to 62,	Bolts, Flush, (Sunk and Projecting)	15
Supp't.	Bolts, Flush, (Sunk)	
64,	Bolts, B. K. Flush, (Common)	30
63,	Bolts, B. K. Flush, (Extra Heavy)	20
Supp't.	Bolts, B. K. Flush, (Extra Heavy)	
63,	Bolts, Plated K. and Slide Flush	10
63,	Bolts, Bronzed K. and Slide Flush	
Supp't.	Bolts, Plated K. and Slide Flush	
59,	*Bolts, B. K. Wrought Shutter	20&10
58,	*Bolts, Wro't Shutter, "Stanley's"	45
58,	*Bolts, " "Wm. Parker"	45&5
58,	Bolts, Cased Shutter	15
59,	*Bolts, Shutter, T. K. Lock	10&5
59,	*Bolts, Shutter, Tinned Knob	
58,	Bolts, Wro't Shutter, Galvanized	30
57,	Bolts, Southern Door	20
52,	Bolts, Wro't Sq. Sp'ng, New List	50&10
52,	Bolts, W't Store Door, New List	
Supp't.	Bolts, W't Store Door, New List	
53,	*Bolts, Wro't Sq. and Round Neck	25
54,	Bolts, Wrought Tower	30
31,	Butts, Back Flaps	35
30,	Butts, Inside Blind	
30,	Butts, Table	
33,	Butts, Narrow	30
32,	Butts, Chest	
32,	Butts, Pew Door	
34,	Butts, Broad	
35,	Butts, Loose Joint	35
Sup. & 28,	*Butts, Reversible, our List	12½
74,	Butts, Reversible, Japanned	12½
29,	Butts, Light Inside Blind, "Stanley's"	30
29,	Butts, Light Inside Blind, "New Britain"	40
29,	Butts, Light Inside Blind, Japanned, "Stanley's"	20
Sup. & 33,	Butts, Light Narrow, list of Narrow	30
29,	Butts, L't Narrow, Jap'd, "Stanley's"	30
22,	Butts, Car, with Acorns	40
16 and 17,	Butts, with Acorns and Fric. Rollers	40
18 to 21,	Butts, Loose Joint, with Japanned Bronzed or Silvered Acorns	40&5
Supp't,	Butts, Loose Joint, do	
23,	Butts, Jap'd Loose Joint, without Acorns	net
24 to 27,	Butts, Parliament	10
64,	Corner Irons	20
72,	Hammers, Carpet	30
70,	*Handles, Flush Chest and Drawer	40&5
70,	Handles, Wrought Chest, "Stanley Works"	add 25
70,	Handles, Wrought Chest, "Austin Beebe"	add 20
71,	Handles, Lifting and Coffin	50
71,	Handles, Window Shutter	20
50,	*Hasps and Staples, Wrought	20&5
50,	*Hasps, Hooks and Staples, Wr't	
50,	*Staples, Wrought, Hand Forged	15
Sup & 50,	*Hinges, H'vy and Ex. H'vy T, "Hart's Pat."	20&10
36 to 43,	*Hinges, Strap and T, New List.	20&10
44 and 75,	*Hinges, Long Chest	
45 and 75,	*Hinge Hasps, Common Staple	
Supp't,	*Crate Hasps, Pat. Swivel Staples	20&10
46,	Hinges, Bulk, Shutter and Flask	add 40
48,	Hinges, Norwich Blind	net
48,	Hinges, Plate and Raised Blind	net
47,	*Hinges, Rolled Plate and Raised	add 12½
15,	*Japanned Screws, American Screw Co's New List	40
65,	Knobs, Canada Sash	25
69,	Staples, Floor, Bolt and Lock	45
73,	Steamboat Shutter Fasts	add 40
49,	Step Ladder Joints	net
51,	Washers, Wro't Iron. Our List. (See Supplement.) Discount 5 cts. per lb.	

The following is the price list of Ice Picks, Ice Mallets and Ice Hatchets made by C. W. Dunlap & Co., 65 Beekman street, in this city:

ICE PICKS	Per gross.
No. 1, Cast Steel Blades, Fancy Ebony Finished Handles	$13 50
No. 3. Dunlap's Patent. Cast Steel Blades, with malleable iron band on handle for breaking ice into small pieces	36·00
ICE MALLETS, WITH STEEL PICK IN END OF HANDLE.	
No. 4, Fancy Ebony Finished, in 1 dozen boxes	24·00
No. 6, with Cast Steel Pick in Head, fancy Black Ebony Finish Handle, in 1 doz. boxes	18·00
ICE HATCHETS.	
Ice Hatchets, large, fine Polished Iron, White Hickory Oval Handle, one dozen in box	24·00

Dunlap's Patent Iron Band Ice Pick is a very superior article which has gained a large sale, and for family and saloon use will be found very desirable. On this article (Ice Pick No. 3), the price is net for less than a gross. In quantities of a gross or over, discount 10 per cent. On all the other articles above given the discount is 15 per cent. This firm are now making a large line of Tool Handles, Tools and Housekeepers' Hardware, which are all distinguished for their excellent quality and finish. Especially noticeable are their Handled Brad Awls with Black Handles. They are put up in 2 dozen boxes and sold at the following prices, less 5 per cent:

HANDLED BRAD AWLS, BLACK HANDLES.

Extra good quality Awls, carefully hardened and tempered, with fancy Black Ebony Finished Handles.

	Per gross.
Assorted No. 1 to 4, in 3 doz. boxes, 4 reg. siz.	$7·00
" " 1 to 6, " " 6 "	7·50
" " 3 to 6, " " 4 largest siz.	8·00
" " 4 to 6, " " 3 "	9·00

The manufacturers claim that these are altogether the best goods of the kind in the market, and we can say that we have never seen anything of the kind equal to their black handles of all kinds. The color penetrates the wood, and makes an almost perfect imitation of ebony. The catalogue of this firm is fully illustrated, and contains a great many things in general demand by the trade.

The Union Nut Company, No 78 Beekman street, have issued the following discount sheet, revised to 1st instant:

Previous discount sheets are hereby made void. Discounts from catalogue of July, 1873. Revised to May 1st, 1874.

Subject to Changes of the Market without Notice.

Page.		Dis. per cent.
27,	Body Loop, Knowles' Patent	50&5
9,	Bolts, Carriage, Common (new list)	75
10,	" " Union (old list)	50&20
11,	" " Philadelphia	50&10
11,	" " (Skelly & Morce's)	50&5
18,	Clip King	net.
12,	Common Tire	75
12,	Union and Philadelphia Tire	50&10
12,	Union Sleigh Shoe	50&5
17,	Cone Head	10&5
17,	Diamond Head Shaft	25&5
16,	Elevator	20&5
17,	Elliptic	10&5
15,	Machine	40
17,	Shackle	10&5
17,	Step and Dash	10&5
12,	Stove	15
13,	Plow (count)	30&5
13,	" in bulk	5
18,	Whiffletree	33⅓
16,	Bolt Ends	40
49,	Boot Jacks	20
35,	Bow Pins	50
33,	Box Hooks	25
39,	Box openers	40
41,	Bull Rings	50
50,	Bung Starts	20
8,	Burs, Riveting	per lb. 9c.
38,	Bush Hooks	20
42,	Can Openers	35
35,	Cattle Leaders	50
38,	Cleavers, Hart's Patent	15
19,	Clip Yokes	20
26,	Clips, Buggy Saddle	25
20,	" Superior Axle	50
20,	" Norway Iron Axles	25
21,	" Spring Bar	25
21,	" for Express and Truck Wagons	20
14,	Coach Screws	40
40,	Cork Screws	30
36,	Corn Hooks	40&10
22,	Couplings (shaft)	35
49,	Cover Lifters	25
39,	Curling Irons, cast	20
39,	" wrought	50
46,	Door Stops	50
23,	Felloe Plates	per lb. 2c.
28,	Ferrules (Brass)	15
23,	Fifth Wheels, Cincinnati	25
32,	Hammers, Blacksmiths', Machinists' Ball Pien and Riveting	20
47,	Hammers, Carpet, Improved	20
48,	" " Polished	15
33,	" Engineers	20
33,	" Machinists' Chipping	20
48,	" Tack	20
33,	" " Steel Polished	25
46,	Handles, Soldering and Roofing Copper	30
34,	Hasps and Staples	50
41,	Ice Awls, Tin Plated	25
42,	" Picks, Patent	25
63,	Level Glasses	60&10
50,	Mallets	15
41,	Meat Hooks, Tin Plated	30
		Per doz. net.
43,	Mouse Traps, Self-Setting Wood Choker	20c.
43,	" No. 1, Case Lots	18c.
44,	" Common	18c.
44,	" No. 2, Case Lots	16c.
		Dis. per cent.
39,	Nail Drawers	40
39,	Nail Sets, Black	25
39,	" Polished	45
34	Nut Crackers	40

	In 10 and 25 lb. Boxes	In 200 lb. and Broken Kegs.	Packages.
	Dis. per lb.	Dis. per lb.	
6, Nuts, Forged and Hot Pressed, Square, for ⅜ and Smaller Bolts	8c.	7½c.	
6, Nuts, Forged and Hot Pressed, Square, 7-16 and larger Bolts	6c.	5½c.	
7, Nuts, Hot Pressed Hexagon, for ⅜ and smaller Bolts	8c.	7½c.	
7, Nuts, Hot Pressed Hexagon, for 7-16 and larger Bolts	6c.	5½c.	
7, Nuts, Cold Pressed, Square and Hexagon	6c.	5½c.	

		Dis. per cent.
61, 62,	Plumbs and Levels	60&10
63,	Plumbs and Level, Improved Pocket	50&10
30,	Rivets, Block and Carriage	25
31,	" in Bulk	net
52-58,	Rules, Boxwood	60&10
59,	Rules, Ivory	50&10
60,	" Miscellaneous	50&10
45,	Sash Pulleys	25
51,	Saw Vise, Patent	50
51,	Saw Set, Hart's Improved, Bench	15
"	" Hand (See Appendix)	15
14,	Screws, Coach or Lag	40
41,	Screw Drivers, for Bit Stocks	33⅓
37,	" Patent Pocket	20
14,	Set Screws and Tap Bolts	10
25,	Slat Irons, Improved Philadelphia Pattern	20
28,	Spoons, Table and Tea	15
47,	Steak Hammer and Ice Hatchet	20&10
24,	Steps, Buggy, Ribbed and Waffle Patterns	30
	" Open Oval, Open Hexagon, and XX Sq. Patterns	40
	Steps, Buggy, Plain Square, Plain Oval and Plain Hex. Pat	45
19,	Stump Joints	15
27,	Turn Buckles	15
34,	Tobacco Points	25
18,	Threshing Machine Teeth, price according to pattern and quantity.	
36,	Wagon Jacks	20
37,	" Lovell's Patent Self-Adjusting	20

	In 10 and 25 lb. Boxes	In 150 lb. and Broken Kegs	Packages.
	Dis. per lb.	Dis. per lb.	
8,	Washers, Iron, for ⅜ and smaller Bolts	9½c.	9c.
8,	Washers, Iron, for 7-16 and larger Bolts	7½c.	7c.
29,	Washers, Tin, Washers and Burs	net.	

	Dis. per cent
22, Whiffletree Hooks, Hawley's Patent	33⅓

William McNiece, 515 Cherry street, Philadelphia, has issued under date of 1st instant a revised and illustrated catalogue of the goods of his manufacture. Among the few changes in the list we notice Hand and Panel Saws Nos. 1, 2 and 2½, formerly marked "Butler & Co.," are now etched "Excelsior Saw Co.", and Nos. 3, 4 and 4½, formerly marked "S. Walter & Co.," are also etched as above, the list prices remaining unchanged. Patent Socket Pole Pruning Saws and Chisels, formerly listed at $14, are now made in two styles at $12 and $10 per dozen respectively; a new Compass Saw, patented March 3d, 1874, with screw ferrule and duplicate blades, price $5 per dozen, net, for Saws complete, and $2·25 per dozen, net, for duplicate blades, and Wm. W. Niece's Handled Straw Knives at $17 per dozen, are new goods worthy the attention of the trade. The discount is 15 per cent. off the entire list, with the exception of Patent Compass Saws, which are net, and Patent Pole Pruning Saws, which are subject to a discount of 10 per cent.

Horace Durrie & Co., 97 Chambers street, have issued under date of 1st instant a circular and price list for Forged Toe Calks, manufactured by the Winsted Hoe Co. These are new goods and are warranted to harden. They are made in four sizes, numbered 1 to 4 respectively, at 13 cents per pound, subject to the following quantity discounts:

	Per cent.
On orders for 100 boxes	5
" " 250 "	7½
" " 500 "	10

We extract the following from their circular:

In calling the attention of the trade to our new Toe Calks, would say that they are strictly forged, and are made of the best metal, which we have adopted, after careful experiments, as the most reliable for this particular use.

These Calks commend themselves to all practical horse shoers as being the original shape they are all familar with, and at the same time effectual y obviate the stereotyped complaints against the two prong Calks in weakening the toe of the shoe where strength is most needed.

Fernald & Sise have placed their Cherry Seeders on the market for the coming season at $15 per dozen, discount 20 per cent. These seeders are favorably known to the trade, and the machine, which is simple in construction, is capable of seeding a bushel of cherries in twenty minutes, without mashing the fruit or squeezing the juice there from.

McCaffrey & Bro., proprietors of the Pennsylvania File Works, Philadelphia, have appointed N. S. Arnold & Co., 312 California street, San Francisco, Cal., their sole agents for the sale of their goods in California, Oregon, Washington Territory, and British Columbia. This firm use all American Steel in the manufacture of their Files and Rasps, and warrant their goods first quality. In Horse Rasps they claim a specialty in tempering that makes them sufficiently hard without being brittle, and say that they are the most durable Rasp in the market, either domestic or foreign. The trade on the Pacific Coast can be supplied with these goods by addressing the agents mentioned above.

We call attention to the advertisement of H. W. Hill & Co., of Decatur, Illinois, manufacturers of Hill's Hog Ringers, Rings and Tongs or Holders, as shown in another page of this paper.

The success of this invention is remarkable. The manufacture of the Ringers and Rings commenced November, 1872, and up to the present time the sales have been over 60,000 Ringers and 12,000,000 Rings, consuming in the manufacture of the Rings 70,250 pounds of wire, measuring over 430 miles. The Tongs, introduced the present season, are selling rapidly.

The mode of operation is fully described in the article given below from the Decatur *Daily Republican* of Feb. 3d. 1873:

"How it is done.—Our readers can testify that we have spoken more than once in these columns on the subject of Hill's Hog Ringer, but it was not until yesterday that the actual operation of ornamenting a hog's nose, *a la* Powhattan, greeted our vision. The subject was a large porker of the female persuasion, belonging to Rev. J. R. Locke, and the operator was Mr. Hugh W. Hill himself, the successful inventor and manufacturer of porcine jewelry. The operation was quite simple, and consisted of the following movements: Seizine her porkship by the ear, Mr. Hill applied his recently invented hog tongs to the snout, clamping that unruly member firmly, and inducing a state of the most perfect quietude to take possession of the hitherto ferocious animal. Three rings were then forced through the cartilaginous projection which surmounts the nostrils, and which is ordinarily used by the porcine family to turn up the soil upon which they tread, and the utility of the aforesaid cartilaginous projection, for rooting purposes, was gone forever. Her porkship, when released, essayed the task of turning over a board which lay on the floor of the pen, using her quondam unfailing nose as a handspike for that purpose, but it was a miserable failure. The hog ring, on the other hand, was a success."

The superiority of the triangular Ring, manufactured only by them, is that a single gripe of the Ringer forces the points of the Ring, which are sharpened, through the nose, completing the ring. And the shape of it fits the end of the hog's nose, so that it is not liable to catch in anything and be torn out. The Ring will not turn in the hog's nose, and the nose heals quickly. We are informed that all the leading jobbing houses of Chicago, St. Louis, Indianapolis Cincinnati, Toledo, Columbus and Cleveland, are handling these goods, and that there is already a large demand in all of the hog raising States.

In a circular dated at Decatur, Ill., May 1st, the following revised prices are given for these goods:

Ringers, per dozen	$6·00
Rings, per dozen boxes (1200)	3·00
Tongs (or Holders), per dozen	9·00
Discounts to the trade:	
6 dozen lots	15 per cent.
12 " "	25 "
36 " "	23½ "

TERMS.—Cash in 30 days from date of invoice; all bills not paid in that time subject to sight draft, with exchange.

Charles E. Walbridge, Buffalo, N. Y., has appointed Fernald & Sise, No. 100 Chambers st., agents for his Patent Reservoir Vases and Hanging Baskets. These goods are admirably adapted for cemetery purposes. "The improvement in these Vases consists in manufacturing "them with a reservoir base to contain water; "the base is divided near the center, the lower "part being the reservoir for water, and the "upper part the receptacle for earth; a tube "connects the upper and lower sections through "which moisture is drawn up by capillary attraction." The Hanging Baskets are constructed on similar principles, and flowers placed in them can be preserved from drought without the constant care which is necessary in the common styles. These goods are made in a variety of elegant designs, are cast from the best quality of iron, and will compare favorably in point of finish with any in the market. An illustration will be found in advertisement on the 25th page.

We invite attention to the advertisement of James C. Jacobs, Wooster, Ohio, who wishes to sell out his business. We are informed that this is a very favorable opportunity to go into the Hardware trade, as the business is, and has always been, an exceptionally good one

We call attention to the advertisement on page 6 of D. H. Whittemore's Paring, Coring and Slicing Machines. We have seen the operation of his Union Apple Parer with push off attachment. In this machine the knife moves half way round in paring each apple, the knife at the half turn backing away for the removal of the pared fruit, when a fresh apple is placed on the fork and the machine again set in motion, the knife moves back at the same speed as the forward movement paring the apple in its course. The addition of the "Push-off" to the improvements of last season, makes the Union a very desirable machine. Mr. Whittemore is manufacturing four styles of Apple Paring, Coring and Slicing Machines; he also offers to the trade his well known Bay State Peach Parers and Peach Stoners and Halvers. The price of the Union Apple Parer, improved for 1874, is $8·50 per dozen.

The famous law suit against Meneely & Kimberly, by E. A. & G. R. Meneely, bell founders of West Troy, has just been decided in the Supreme Court. The action was brought to restrain the defendants from using the name Meneely in the bell business at Troy, on the ground that the plaintiffs had acquired a monopoly of the use of that name in that business, as a trade mark, and that by virtue of the will of the father of the plaintiffs and the defendant Meneely. The referee before whom the case was tried decided in favor of the plaintiffs, and granted the injunction asked for; but this has now been reversed and set aside by the General Term of the Supreme Court at Elmira, Justice Miller writing the opinion.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, May 20, 1874.

Scotch Pig.—The market is quiet. The demand is falling off, and but little business doing. Prices are nominal.

Rails.—The market is dull, with a small demand. Prices nominally without change, viz.: £8. 5/ @ £9, for Welsh.

Manufactured Iron.—Best Staffordshire Bars may now be quoted, £11 @ £12.

IRON.

American Pig.—The depression in the Iron market continues to increase. There is very little demand, and the Pig Iron manufacturers seem to be quietly preparing themselves for a long dull summer. In the Lehigh region, the Carbon Company, at Parryville, have blown out a furnace. There are fresh reports of dissatisfaction at several of the furnaces in the valley, and there is no question but a number of stacks will be blown out soon, unless a great change takes place in the market. Prices have settled down somewhat, and while Gray Forge is not plenty, No. 2 Foundry can be had at $28 @ $29 at furnace. The Crane and Thomas Companies are holding firmly at $35 for No. 1 Foundry, and as a consequence are selling very little, as good Iron of this grade is credibly reported to have been sold at $32, and there would be no difficulty in buying at $32·50, at which price Allentown Iron is offered, and 50 tons have been sold. There is a very general feeling that the bottom has not been reached, and it is certain that the offer of cash for any considerable quantity would induce concessions. In reference to our notice last week of a "re-"ported resale of 1000 tons of Jagger Iron, of "which the particulars are not known," that Company write us as follows: "The Jagger "Iron Company did buy back 1000 tons No. 1 "Iron that we sold four months ago, in order "to get Iron to fill our customers' orders, "and we have not at present any No. 1 Iron on "hand, our customers taking it as rapidly as "we can produce it." It is impossible to make any close quotations in the present unsettled state of the market. The following figures represent the market as nearly as possible, the higher figures in each grade being entirely nominal: No. 1 Foundry, $32·50 @ $35; No. 2 Foundry, $30 @ $33; Gray Forge, $27 @ $30.

Scotch Pig.—There are small stocks of Scotch Iron here, which are held at about the prices of last week. The transactions have not been large, but the smallness of the stocks makes holders firm in their views. We quote Coltness, $40; Glengarnock, $37; Eglinton, $34 @ $35.

Bar.—Bars are still inactive. Mill owners have become tired of waiting for the expected change, and are more generally pursuing the policy of running part time to fill their orders, without accumulating stock. Refined Bars are now sold at from 2·8c. @ 3c.

Rails.—There is no change in the market for either American or Foreign. We note sale of 1000 tons American, 56 lbs., on private terms. We quote Welsh, $52 @ $54, gold, and American, $60 @ $62·50, currency, at works. Almost all the mills have stopped.

Old Rails.—We note the sale of 2000 tons, mixed Ts and Double Heads, which have been held here for a long time, at $36. This lot was bought for speculation. We also note sale of 200 tons on private terms. Offers are now made from the other side to deliver Old Rails here at £5. 10/. This with duty added would make them cost at present a little over $38, currency. We quote Ts here, $36 @ $38.

Scrap.—There have been no transactions here and the price remains nominally, $40.

METALS.

Copper.—The market has been quiet, with sales of 250,000 pounds Lake, in lots, at 24¾c., on the spot, and some future transactions at the same figure, for delivery from June to September, inclusive. The representative of the leading Lake Copper interests showed us a dispatch dated to-day, ordering the covering of talk on immediate shipments, leading to the inference that the first Copper of the season will be moved coastward to-morrow. We are obliged to the same gentleman for the following dates at which Lake Copper began to be shipped in previous seasons: 1868, on May 9th; 1869, on the 12th; 1870, on the 2d; 1871, on the 1st; 1872, on the 15th; and last year on the 14th, when it arrived here on the 28th. We can, therefore, expect the first copper to be to hand on the 5th proximo. The market closes strong at 24¾c. @ 25c. Some 200 Chili Bars have arrived from England, and, as the market stands, the importation results in a heavy loss. Such importations are not likely to be repeated. The latest telegram to hand from London, dated yesterday, quotes Chili Bars £74; a summary dispatch, received from Liverpool to-day, mentions an improved outlook in the general metal trade in England, without singling out any one article in particular. By the last mail we received particulars from London of the visible supply of Copper in the North of Europe on May 1, which make a much more favorable show than had been supposed, considering the heavy Chilean charters, upon which, for speculative purposes, so much stress had been laid. Stock at London, Liverpool, Swansea and Havre, of foreign and English Copper, and afloat from Chili, May 1, 1874, 36,606 tons, against 39,374 same date 1873, and this in spite of the heavy English import during the past four months of 19,303 tons, against 15,250 in 1873. There was a better feeling in France in consequence. The last mail from Valparaiso *via* Aspinwall brings us our own correspondent's letter, which reads as follows: VALPARAISO, April 17.—*Copper in Bars.*—The uninterruptedly unfavorable accounts from England have been productive of a depressed feeling in our market, and a decline to-day to $17, on shore here and on board at Guayacan, at which rate several parcels have changed hands, the day winding up in a listless manner. The sales foot up 18,067 quintals, in lots, beginning with $17·25, then declining to $17·15 and $17, on shore here and on board at Coquimbo, Lota and Guayacan, at 55 @ 60 freight. Nothing has transpired in either Regulus or Ore. I quote Regulus, 50 per cent., $7 @ $7·37, and Ore, 25 per cent., $2·85 @ $3. Exchange, 60 days' sight, London, 44¾d. @ 45d.; 90 days, 45d. @ 45¼d., per dollar. The manufactures of Copper have been quiet and steady, as follows: New Sheathing at 33c.; Bolts and Braziers, 35c.; Bronze and Yellow Metal Sheathing, 24c., and Yellow Metal Bolts, 30c., net cash.

Tin.—There has been but a light demand, and the stocks of all kinds are now in full supply; the local dealings have been nominally circumscribed in extent, some English Refined selling at 22c., gold, and nothing transpiring in futures. The following are the cable dispatches received during the week: PENANG, May 18, $24¾; LONDON, yesterday, Common English, £99; English Refined, £102; and Straits, £98 @ £99, the latter nominal; and SINGAPORE, to-day, $26. It will be seen that Straits has kept £2 above the opening figure of the month. The following are the closing quotations: Straits, 23½c. @ 24c., gold; English Refined, 22c. @ 22½c.; Common English, L. and F., 21¼c. @ 21½c.; and Banca, 26½c., all gold. Tin Plates have, on the whole, not been over active, the sales for the week being confined to 4200 boxes, but are reported in better demand toward the close. The whole course of the market has not answered expectations, and but for the English lock-out, which bolstered up the article, we should have declined, and considerably, without a doubt. As it is, the market is tolerably well sustained at the following rates: I. C. Charcoal, $10·50 @ $10·75, gold, per box; I. C. Coke, $7·37½ @ $8·25; Coke Terne, $7 @ 7·75; Charcoal Terne, $9 @ $9·50, all gold.

Lead.—There has been little done in this metal, which closes very dull, the sales being limited to some domestic at 5¾c., gold, 50 tons changing hands at this figure, and the market closing with a slightly better tone at 5⅞c. for that description, while foreign, without any transactions to record, ranges nominally no higher than 6⅜c. @ 6½c., gold. Mr. William Paulsen, the agent in this city of the Stolberg Co., has prepared a table showing the analysis of selected Stolberg Lead since January 1st, 1873, month by month, the impurities for January of that year indicating but 0·00461, and thus leaving 99·99539 per cent. pure Lead, the last three fractions being, instead of 461 in January, 725 in February; in March, 428; in April, 667; in May, 667; June, 477; July, 664; August, 1·036; September, 565; October, 627; November, 540; December, 751; January, 1874, 614; February, 584; and March, 533. The traces of Copper were less than one pound in a million pounds of Lead. The manufactures of Lead keep steady at the following quotations: Bar at 8¼c., Sheet and Pipe at 9c., and Tin Lined Pipe at 16½c., less trade discount.

Spelter and Zinc.—Nothing worth reporting has transpired in Spelter, which remains stagnant at 7c., currency, for Missouri, and 6½c. @ 6⅝c., gold, foreign, nominal quotations. In a jobbing way domestic is bringing 7½c. Zinc is quiet, transactions being of a jobbing nature only. Sheet Zinc, 8¼c. @ 8½c., gold, for Silesian and Mosselman Sheet, and 8¼c. for Western.

Antimony, with a moderate demand, is sustained at 12⅝c. @ 12½c., gold.

COAL.

The Coal market is a trifle better this week, as compared with last, although the demand for Anthracite was light, and the arrivals have been liberal. Dealers and manufacturers will do well to lay in their stocks before the 1st of June, as circulars have already been issued which will advance the schedule of prices 10 cents per ton. We hear a sale reported of 10,000 tons Cumberland coal to the Cunard Line at about $4·35. At Georgetown, James River, Cumberland is selling at $6·25 @ $6·50 per ton, which is the wholesale price for large orders. There is also a report circulated that the Pennsylvania Gas Coal Company have contracted for 30,000 tons on terms not made public.

We have no definite change to report in the market for Bituminous Coal. The quotations for Anthracite are $5 to $6, by the cargo. For Gas coals the prices are: Pennsylvania and Westmoreland Gas, $7·50 @ $8; West Virginia, $7·75; Cumberland, soft, $6·75 @ $7.

The trade in Foreign continues very dull, and the market is overstocked. The quotations are: Liverpool House Cannel, $20; Liverpool Gas, $11; Newcastle Gas, $7·50 @ $8; Scotch, $8 @ $10, currency.

The coal shipped over the Cumberland Branch Railroad during the week ending May 16, 1874, amounted to 3161 tons, as against 4456 tons transported in the same week last year, showing a decrease of 994 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 51,804 tons, against 52,240 tons shipped in 1873, a decrease of 435 tons.

The quantity of coal sent from the Pottsville region last week by rail was 95,284 tons; by canal, 22,842; for the week, 118,126 tons, against 90,433 for the corresponding week last year; increase, 22,842 tons. The quantity sent for the week from all the regions was 457,961 tons Anthracite, and 78,981 Bituminous; for the week, 536,842 tons, against 488,315 tons for the corresponding week last year; increase for the week, 48,527 tons. The supply from all the regions so far this year is 6,439,478 tons, against 6,588,410 to the corresponding period last year; decrease, 148,932 tons, at which 207,218 are Anthracite.

OLD METALS, PAPER STOCK, &c.

The market for Old Metals, Rags and Paper Stock has been fairly active this week, and dealers report that business is slowly reviving. We have nothing new to note in the way of changes in our market quotations, with the exception of a decline of one-quarter cent per pound for Grass Rope. The purchasing prices offered by the dealers are as follows:

Old Metals.—Copper, 18c. @ 20c. per lb.; Yellow Metal, 13c.; Brass, 13c. @ 14c.; Composition, heavy, 14c. @ 15c.; Lead, solid, 6c.; Tea Lead, 5c.; Zinc, 4c. @ 5c.; Pewter, No. 1, 19c.; do. No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1¼c.; Sheet do., ½c.; Cast, do., ¾c. @ 1c.; Machinery, do., 1c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No. 1, 6c. @ 6½c.; No. 2, 2½c.; White, No. 1, 6½c.; No. 2, 4c.; Colored, do., 2c. @ 3c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5½c.; Gunny Bagging, 1¼c. @ 1½c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c. @ 3½c.; Book Stock, 3½c. Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c. @ 4½c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3½c.; Tarred Shaking, 1c.; Grass Rope, 3¼c.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending May 19, 1874:

Hardware.

Boker Hermann & Co. Mdse. pkgs., 4; Casks, 13
Bawo & Dotter, Cases, 1
Davis B. Arms, bxs., 1
Fisher J. L. Casks, 19
Field A. & Co. Packages, 40
Hilger E. & Sons, Mdse. pkgs., 1
Hayden & Co. Cases, 2
Jones B. W. Chains, cks., 12
Laughland & Co. Wire, pkgs., 41
Morris L. W. Cases, 1
Mason John W. & Co. Wire rope, coils, 5
Markt & Co. Iron ware, cs., 16
Quackenbush & Co. Casks, 2
Robbing & Sons. Wire, cks., 8
Schoverling & Daly, Mdse. cs., 3
Saxon & Seabury, Boxes, 7
Seymour & Co. Cutlery, cs., 1
Tillotson L. G. & Co. Wire, lots, 267
Townsend & Co. Wire, cs., 1
Wiebusch F. Mdse. pkgs., 6; Cases, 6
Order. Cases, 4; Casks, 3; Wire, bdls., 163

Iron.

Brookman H. D. & J. W. Scrap, tons, 41
Darrell & Co. Scrap, lbs., 20,249
Drexel, Morgan & Co. Rails, 753
Goddard & Bros. Boxes, 25
Henderson Bros. Pig, tons, 300
Lang W. Bailey & Co. Bundles, 280; Bars, 48; Plates, 2
Naylor & Co. Rails, 63; Fish plates, bdls., 820; Mdse. pkgs., 4
Reeves, Osborne & Co. Scrap, tons, 104
Order. Scrap, tons, 41; Fish plates, bdls., 673; Rails, 291

Steel.

Congreve Chas. & Son, Rails, 1050
Hopkins E. T. Bundles, 106
Hogan John, Cases, 2
Jackson Wm. Bundles, 93; Cases, 3; Bars, 1
Jackson R. D. & Co. Bundles, 214
Lang W. Bailey & Co. Bundles, 142
Naylor & Co. Rails, 67; Bessemer rails, 558; Cases, 12
Sanderson Geo. & Co. Casks, 23; Bundles, 7
Order. Rails, 3141; Bessemer rails, 501; Bundles, 432; Cases, 10

Metals.

Agency Bank California Lead, cs., 43
Baldwin Bros. Tin, cs., 3
Bruce & Cook, Tin plates, bxs., 372; Tin, slabs, 150; Antimony, cks., 15
Billings F. W. Lead, bars, 5904
Byrne Joseph & Co. Tin, ingots, 1139; slabs, 849
Douglas Wm. Scrap, bxs., 1; Pieces, 3
Hart Lucius, Tin, slabs, 60
Haxtun P. Lead, pigs, 10,000
Krolin Thos. Lead, bars, 39
Phelps, Dodge & Co. Tin, ingots, 600; Tin plates, bxs., 6941; Copper, bars, 200; Antimony, cks., 50
Reeves, Osborne & Co. Scrap, copper, lbs., 2260; Scrap, brass, lbs., 1600; Scrap, lead, lbs., 1950
Roche Bros. & Co. Scrap, brass, lbs. 62; Scrap copper, lbs., 2049½
Stern Felix B. Scrap copper, pkgs, 4
Windmuller L. & Roelker Zinc, cks., 10
Order. Tin, slabs, 340

PITTSBURGH.

PITTSBURGH, May 18, 1874.

PIG IRON.—There has been a fair degree of activity during the past week, the aggregate sales reported being somewhat larger, and, as a rule, at higher range, although, at the same time, it is but proper to state that there was no advance, but the bulk of the operations were in a better class of Irons. As noted in my last, the feeling still prevails that the market has almost, if not altogether, touched bottom, and it is rumored that there have been some purchases recently on speculation, indicating which way the wind blows, yet the mills almost without an exception are refusing to buy except for immediate wants, being determined to keep their business well in hand, particularly as long as money matters continue in their present unsatisfactory and unsettled condition. The most of the furnaces in this vicinity are still in blast, but they are not working up to their full capacity, and it is almost certain that unless there is a radical change in the position of the market in the meantime, they will blow out as soon as they have worked up what ore they have on hand and contracted for to arrive. It is deemed best to work up what stock they have into Pig, which can be banked and held until such time as the market affords a margin for profit. Quite a number of the furnaces west of here, in the Shenango and Mahoning valleys, have blown out, and others in the same locality will follow suit as soon as they have worked up ore. The outlook at this writing warrants the conclusion that there will be an almost general suspension within the next 30 or 40 days. There are several good reasons for drawing this inference, the most prominent of which are an over production, the supply is largely in excess of the demand, and, as a consequence, prices are down below actual cost. Gray Forge Irons may be quoted at $27 to $28, cash and time, that is for standard brands; No. 1 Foundry, $32 to $33, 4 mos.; No. 2, $29 to $30; White and Mottled, $24 to $25.

MANUFACTURED IRON.—While trade is, as it always does at this particular time, falling off, the mills still have about all they can do, although some of them have begun to talk about stopping, when the extra dollar per ton for puddling goes on, next month, claiming that the present position of the market does not warrant any additional expense. Some manufacturers allege that there is no margin at current rates, and there is no chance to advance prices; they can see no alternative, only to stop. As intimated in my last, there could be considerable sold for future delivery by shading present prices somewhat, but makers are all refusing to make concessions, and it is doubtful whether an order for a round lot could be placed at current rates, say $2·60 to $2·65. The feeling is generally entertained that prices are as low as they are likely to go, hence there is some inquiry on speculation, and both jobbers and consumers are disposed to stock up largely, believing that Manufactured Iron is good property at present rates, and for the same reasons refusing to sell except in a regular way to regular customers.

NAILS.—There is a continued fair demand, and while orders are not as numerous as they were a month ago, nor are to be expected, the mills still have about all they can do, as the most of them were behind with their orders. As regards prices, there has been no quotable change, $3·60 to $3·65. It is said—I can vouch for its correctness—that offers have been made in some of the leading Western markets equal to $3·45 here, and manufacturers are discouraged in consequence, claiming, as they do, that the margin for profit, even at $3·65, is small enough, and that at $3·45 there would be none at all, if not an actual loss. So far as I can learn there have been no sales made here under $3·60, and makers do not appear anxious for orders even at that.

STEEL.—The Steel trade, so far as Pittsburgh is concerned, continues fairly active, and while the mills are not pressed with orders, the most of them are reported as having about all they can do. The inquiry is mostly for tool and agricultural purposes, while as regards prices there has been no quotable change.

SCRAP IRON.—Trade continues dull, in sympathy with Pig Iron, and there is but little prospect of an early improvement, as some of the mills are talking about "shutting down" soon; prices, however, are nominally unchanged. Dealers quote buying rates as follows: Old Wheels, $28 per gross ton; Cast Turnings, $12; Oily Screw Cuttings, $15; Burnt Grate Bars and Castings, $12; Old Castings, $25.

COKE.—This important branch of business continues very much depressed, and the indications at present are that there will soon be a general suspension, as, even if there was a demand for it, which there is not, current rates scarcely cover actual cost; $2·75 to $3·00 per ton, delivered free on cars in Pittsburgh.

WROUGHT TUBING.—Trade is reported fair, although not as good as it usually is at this particular time. It is probable, however, that our manufacturers will have about all they can do during the balance of the season. I forgot to state in my last that while a new list was adopted, there was no change made in the discount—25 per cent.

The Pittsburgh *Commercial* of the May 16th, says: The market for Raw Irons the past week remains about the same as at date of last report, with little prospect of improvement in the near future. The volume of sales just about covers the weekly consumption, and we cannot reasonably expect much improvement while the price of Manufactured Iron and Nails remain as they now are. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.	
1,060 tons gray forge	$27·00—4 mos.
350 tons gray forge	27·00—cash.
300 tons gray forge	28·50—cash.
300 tons gray forge	26·00—cash.
200 tons gray forge	28·00—4 mos.
200 tons gray forge	28·00—6 mos.
100 tons No. 3 mill	27·00—4 mos.
109 tons mottled	26·00—4 mos.
100 tons gray forge	28·00—4 mos.
100 tons close gray and mottled	26·00—5 mos.
70 tons white	25·50—4 mos.
50 tons mottled	26·50—4 mos.
50 tons white	24·50—4 mos.
30 tons foundry	31·00—4 mos.
25 tons foundry	30·00—4 mos.
26 tons No. 1 foundry	$32·00 @ 33·00—4 mos.
20 tons No. 2 foundry	28·00—4 mos.
20 tons No. 3 foundry	28·00—4 mos.
20 tons silvery	25·00—4 mos.
10 tons No. 3	30·00—cash.
ANTHRACITE.	
100 tons gray forge	$27·50—4 mos.
25 tons gray forge	25·50—cash.
EASTERN COKE.	
20 tons No. 1 foundry, cold blast	$50·00—4 mos.
10 tons No. 1 foundry, cold blast	50·00—4 mos.
HANGING ROCK CHARCOAL.	
60 tons No. 2 foundry	$36·00—5 mos.
38 tons No. 3 foundry	32·00—4 mos.
36 tons No. 2 foundry	35·00—4 mos.
19 tons No. 1 foundry	$38·00 @ 40·00—4 mos.
10 tons cold blast	50·00—4 mos.
CONNELLSVILLE COKE.	
300 tons gray forge	$27·00—4 mos.
200 tons gray forge	27·00—4 mos.
100 tons gray forge	26·00—cash.
100 tons gray forge	28·00—4 mos.

CINCINNATI.

Messrs. ADDY, HULL & Co., under date of May 18, write us as follows: There is no improvement to note since our last advices. No. 1 Foundry grades have been in limited demand, beyond which, however, no considerable transactions have taken place. Mill grades are entirely without demand, and quotations are nominal.

HOT BLAST CHARCOAL.	
Hanging Rock No. 1.. ℔ ton	$34·00 @ 37·00—4 mos.
" " No. 2	32·00 @ 34·00—4 mos.
" " Forge	29·00 @ 30·00—4 mos.
Tennessee No. 1	32·00 @ 34·00—4 mos.
" Forge	29·00 @ 30·00—4 mos.
Alabama No. 1	32·00 @ 34·00—4 mos.
Missouri No. 1	36·00 @ 37·00—4 mos.
" No. 2	35·00 @ 36·00—4 mos.
HOT BLAST STONE COAL.	
Missouri No. 1.... ℔ ton	$35·00 @ 36·00—4 mos.
" Forge	29·00 @ 30·00—4 mos.
Ohio No. 1	33·00 @ 35·00—4 mos.
" Forge	29·00 @ 30·00—4 mos.
Scotch Pig, No. 1	.. ..
COLD BLAST CHARCOAL.	
Hanging Rock Car Wheel ℔ tn.	$50·00 @ 52·00—4 mos.
Missouri " "	50·00 @ 52·00—4 mos.
Kentucky " "	50·00 @ 52·00—4 mos.
Tennessee " "	50·00 @ 52·00—4 mos.
Georgia " "	50·00 @ 52·00—4 mos.
Alabama " "	50·00 @ 52·00—4 mos.
Machinery and Forge	.. @ .. —4 mos.
Blooms	90·00 @ 95·00—4 mos.

LOUISVILLE.

Mr. GEO. H. HULL, under date of May 18, writes us as follows: The market is dull and lower for nearly all grades. Large sales can only be effected by making some concessions, the legitimate demand being confined to small lots for immediate use. The usual time, 4 mos., is allowed on the quotations below:

HOT BLAST CHARCOAL.	
No. 1 F'dry, from Hanging Rock Ores	$34·00 @ 37·00
" 2 " " " "	32·00 @ 34·00
" 1 Forge, " " "	29·00 @ 30·00
" 1 F'dry, from Tennessee Ores	33·00 @ 35·00
" 2 " " "	32·00 @ 33·00
" 1 Forge, " "	29·00 @ 30·00
" 1 F'dry, from Alabama Ores	34·00 @ 36·00
" 1 " " Iron Mountain Ores	36·00 @ 38·00
HOT BLAST STONE COAL.	
No. 1 F'dry, from Missouri Ores	34·00 @ 35·00
" 2 " " " "	32·00 @ 33·00
" 1 Forge, " " "	28·00 @ 29·00
COLD BLAST CHARCOAL.	
Car Wheel from Hanging Rock Ores	55·00 @ 58·00
" " Tennessee Ores	50·00 @ 53·00
" " Alabama Ores	53·00 @ 55·00
" " Georgia Ores	53·00 @ 55·00
" " Missouri Ores	50·00 @ 53·00
" " Kentucky	50·00 @ 53·00

CLEVELAND.

Messrs. READ & DICKEY, Iron Brokers, under date of May 18, write as follows:

PIG IRON.—The Pig Iron market for the past week presents no new features of importance, but still, in defiance of all known laws of supply and demand, continues to grow weaker, if anything, as stocks decline. The mills continue to use an average quantity, as they are nearly all running to their full capacity, and no doubt the sales would be nearly, if not quite, as large if the price was better sustained, for no concession in price will bring, except in a few cases, an order for more than one to two weeks' supply. Out of the 52 blast furnaces in the Mahoning and Shenango Valleys 27, or more than half, will be out of blast by the end of the present week, while several more will follow their example as soon as their present stocks of ore will be worked up. The stock of Iron at present held by the furnaces is hardly more than sufficient to last the mills thirty days, while, if they continue to use metal at the present rate of 2000 tons or over per day, it would require the product of 65 to 70 furnaces, to say nothing of the wants of foundrymen and others. A large proportion of Iron at present owned by the furnaces is of inferior quality, and has been made with a view to meet, if possible, the low prices at which it is sold, so that it is already a fact beyond dispute that good No. 1 Mill Iron is really scarce. Very few of the furnaces not directly connected with mills have bought, or intend to buy, any ore in the present condition of the market, while, in view of the contemplated reduced production and want of confidence in financial circles, ore owners are not anxious to press sales, and will prefer "to go slow" this year. It is stated, however, on good authority that a fair average yield of No. 1 Ore has been already bought or spoken for, as the mill and charcoal furnaces will run, and they, together with some outside furnaces and the 100,000 tons used by the mills for "fix," will bring the actual quantity needed up to 750,000 or 800,000 tons, nearly all of which will be No. 1 Ore, if it can be supplied, as there is no demand or sale for the lower grades. Last year the total quantity mined was something less than 1,250,000 tons, under a great pressure, and the figures this year would be considered high at 1,000,000 tons, so that the margin left to be filled up by the cheap grades, which must necessarily be mined, is only one-fifth of the whole amount. In view of the foregoing facts it seems impossible that the present low prices of Pig Iron can long continue, and in this opinion we have practical backing, as it is now known to some extent that a few of the largest Pittsburgh mill owners have been quietly buying all the cheap Pig Iron they could get without exciting the market, and in this way have got control of considerable Iron which as yet lies at the furnaces. We quote, f. o. b., cars or boat, here:

CHARCOAL PIG IRON FROM L. S. ORE.	
Nos. 1 and 2 Foundry	$40·00—4 m.
Nos. 3 and 4 Car Wheel	42·00—4 m.
Nos. 5 and 6	45·00—4 m.
Bessemer Metal, Charcoal	42·00—4 m.
Bessemer Metal, Bituminous	34·00—4 m.
BITUMINOUS PIG IRON FROM L. S. ORE.	
No. 1 Foundry	$32·00—4 m.
No. 2 Foundry	30·00—4 m.
No. 1 Gray Forge Red Short	27·00—4 m.
Gray Forge Neutral	26·00—4 m.
White and Mottled	25·00—4 m.
PIG IRON FROM BLACK BAND ORES.	
Massillon No. 1	$36·00—4 m.
Massillon No. 2	34·00—4 m.
"New Gartsherrie" No. 2	35·00—4 m.

MANUFACTURED IRON.—The volume of business still continues fair in quantity, with perhaps a slight improvement in prices asked, although we think this arises more from the fact that orders are better distributed than from any general stiffness in the price. Eastern buyers have been quite largely represented at the mills for the past ten days, but have not been very successful in having their views acceded to. No mill owner will, at present, take orders for more than two weeks ahead, and the feeling seems to be gaining ground that they will sell as much Iron without making such ruinous sacrifices. The approaching hot weather is also having its effect, and trouble with the men is expected, so that it is fair to presume the production will soon be somewhat reduced. Sheet Iron is much in demand at present, and is sold very low for immediate delivery, although the mills, as a rule, refuse all orders for which specifications are not forthcoming, and shippers' option for delivery.

NAILS.—The demand for Nails has not been so brisk the past week, but there is no decline in price to note, as makers are well aware that stocks are very light, and that their full production is needed to fill actual wants. We quote prices from *store* here:

	Rates 60 days.
Bar Band and Hoop Iron	2⅞c.
Sheet Iron, for No. 24	4¾c.
Nails 10d and larger	$3·75
Ship Spikes ⅜ and larger	$4·25

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of May 19, 1874: We have no improvement to note in this market for the past week. Trade still continues dull and depressed, and that moving is done at about cost to dealers. We quote the list unchanged, but shaded for cash orders.

AMERICAN REFINED BAR IRON.						
1 to 6 wide by ⅜ to 1 thick / 1 to 4½ wide by 1⅛ to 2 thick	3 to 3 1-10c					per ℔.
Round and square, ordinary sizes, from ⅜ to 2 inclusive	3 to 3 1-10c.					"
Hoop Iron, 1⅛ wide and upward	4⅜ to 5c.					"
Band Iron, from 1⅛ to 4 in. wide	4 to 4⅜c.					"
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ⅝ thick	4⅛ to 5c.					"
Norway Nail Rods	7¾ to 8⅛c.					"
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	16½c.					"
Machinery Steel	11½c.					"
Cast Spring Steel	11c.					"
Homogeneous Steel Plate	13c.					"
Perkins' Horse Shoes, per keg of 100 lbs.						$5·87½
" Mule Shoes " "						6·87½
Common Horse Nails, from 14c. to 18c per pound.						
	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per ℔.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per ℔
R. R. Spikes	5⅛ by 9-16 at 3¾c. to 4c. per lb.					

ST. LOUIS.

Messrs. GARRETT, MCDOWELL & Co., under date of May 16th, send us the following: The trade still suffers the dullness and depression that has prevailed for several weeks, and with no large sales prices quoted can only be considered nominal. Considerable sales of low grades mill the past week below quotations. Sales of Foundry grades only in small lots for immediate use. We quote:

HOT BLAST STONE COAL.	
No. 1 Foundry, from Iron Mountain and Maramec Ores	$32·00 @ 33·00
No. 2 Foundry, from Iron Mountain and Maramec Ores	29·00 @ 30·00
No. 1 Forge, from Iron Mountain and Maramec Ores	27·00 @ 29·00
No. 1 Foundry, Tennessee Cold Short	32·00 @ 34·00
No. 1 Foundry, Massillon, Ohio	40·00 @ 42·00
HOT BLAST CHARCOAL.	
No. 1 Foundry, from Iron Mountain and Maramec ores	35·00 @ 40·00
No. 2 Foundry, from Iron Mountain and Maramec Ores	32·00 @ 36·00
No. 1 Foundry, from Tennessee Ores	34·00 @ 36·00
No. 1 Forge, " "	31·00 @ 33·00
No. 1 Foundry, from Hanging Rock Ores	35·00 @ 37·00
COLD BLAST CHARCOAL.	
Car Wheel, from Hanging Rock Ores	52·00 @ 55·00
" " Tennessee Ores	50·00 @ 52·00

FRANCE.

(Le Moniteur des Interets Materiels.)

PARIS, May 8, 1874.—*Copper.*—There was a certain tendency toward a general improvement in the European Copper markets when the West Coast charters for the second half of March became known, of 2500 tons against 1400 in 1873, raising the total for the quarter to 13,100, against 9800 in 1873, a circumstance which, combined with the prostration in European metal matters, was sufficient to banish, at least for the moment, every chance of a rise in values. We ought to be prepared for continued weakness, and even a further giving way. The London market is reported by telegraph to-day to be remarkably quiet; Chili Bars, good ordinary brands, £73. 10 to £74; best brands, £76 to £77; Burra Burra Cake, £83; Wallaroo Cake, £85; Tough Cake and Ingots, £82 to £83; Best Selected Ingots, £84. 10/ to £85. Visible supply in the North of Europe 36,606 tons, against 39,374 in 1873, and 34,235 in 1872. Yellow Metal, 8d. per pound. There has been a livelier market here, at Paris, and Copper is firmer, in view of the more favorable general statistical position, there being a decrease of 2768 tons in the visible supply, despite the heavy Chilean charters; thus Chili Bars, deliverable at Havre, are 202·50 francs; Ordinary, 197·50, and Ingots, 212·50; English Tough Cake and Tile, 212·50, and Corocoro Mineral, 200 francs. Although Havre has been but quiet, yet the tendency has been an improving one, to be checked, subsequently, by the Chili telegram, first brands remaining 202·50 to 205; good brands, 198·75 to 200; Lota and Urmeneta, 196·25 to 197·50 francs the 100 kilos. Marseilles remains quiescent; there is little transpiring there, Spanish in slabs at 205, and Chili Refined Ingots 215 francs. In Germany the markets have been distinguished by a remarkable degree of unsteadiness, which has stopped business. At Berlin there is a good consumptive demand, with a slight improvement in rates, good sorts being at the close 29 to 30 thalers the 50 kilos. There is an absence of larger dealings at Hamburg, and no change. Tin has not been upheld in its sudden upward turn in the London market. Banca, from there, is telegraphed to us £98; Straits, cash, £96; three months prompt, £97; Australian, £98; English, in slabs and ingots, £100; Rods, in barrels, £101; Refined, £103. This is another £1 decline upon the price list agreed upon by the English smelters at their 24th April meeting. After quite a rise in our own (Paris) market, the metal receded at the close of the week; still we have retained from 5 to 10 francs of the recent amelioration. Banca, deliverable at Havre or Paris, 260 francs; Straits 250; English, deliverable at either Havre or Rouen, 265 francs. Our Marseilles despatch reads as follows: "English speculators having appeared in our market, great irregularity is observable, the range being from 250 to 270 francs for Straits. Not much confidence is expressed here in the stability of the outside quotation, the stock being ample for all purposes." In Holland the metal has been ranging during the week as follows: "Spot" Banca, between 56 and 57 guilders, up and down, in order to close at the latter quotation. The German markets are wavering. After having been stirred up by the Anglo-Dutch excitement, the markets have flattened down into a condition worse than the one they started from, and a true quotation is not an easy matter at the close. *Lead.*—The metal finds it difficult to awake from the torpor it has drifted into; London is nominal at £20. 10 to £21; W B at £24; Spanish and German, soft and without silver, £19. 15 to £20. The remaining European centers are also quiet, and we are rather weak at Paris at 50½ francs for French, deliverable here, 52 Spanish at Havre, 51 English and 52½ Belgian and German here. No Change at Marseilles. The metal is more freely offered in Germany, but sustained. *Spelter* remains stagnant in the London market at the following quotations: Silesian, spot, £21. 15 to £22. 10; English, soft, V & S, at London or Havre, £22. 15 to £23. At Paris we remain unaltered—Silesian, at Havre, 55½ francs; here, 56 francs. Germany is as devoid of life as are England and France, with great weakness in prices, and with sales at Hamburg of 1000 quintals, at 21·90 marks. *Iron*—There is a considerable abatement in the Iron production of France, both in the North and East. While work is kept going at all the forges, it does not exceed the supplying of immediate requirements. The consequence is that stocks begin to dwindle down, and that we are thus preparing a better future in our midst, which will become manifest the moment the demand revives, even though this be but to a moderate extent. Our works avail of the prolonged lull to put into practice a good many new processes. *Coal*—No change here. Prices are weak.

BELGIUM.

(Le Commerce.)

BRUSSELS, May 2, 1874.—*Iron*—Business is looking up a little in Belgium, and all our forges are in full blast, although prices obtained are so very low that the margin of profit thereon to the maker is anything but a remunerative one. English Pig is higher, but Luxembourg continues to be offered at 70 to 75 francs per ton. "Moulage" remains unaffected by foreign competition. Some contracts of a certain magnitude with foreign countries have been made, especially with Italy, and we feel persuaded that Belgium but needs a few representatives who know what they are about, and we can do a much larger business with countries on the American Continent. With few exceptions our manufacturers have but few travelers abroad, and are consequently not fully posted about the wants of transatlantic consumers; yet this is a field of enterprise which should engage their attention. The "Industrial Exchange," at Liege, promises to become a success. For every Wednesday a "Metal and Coal Exchange" is to be opened in this city, which day of the week will coincide with the opening government tenders. *Coal.*—A good deal of discussion has been elicited by the latest opening of tenders to the government at Liege and Charleroi, and the French industrial press has been as deeply engaged in canvassing the drift of prices as our own, some papers thinking that bottom has been touched, and others, on the contrary, being of opinion that we shall decline still further. On the whole, the market still shows signs of weakness, but prices remain unaltered, there being no larger bargains made to test the market.

GERMANY.

(Le Commerce.)

ESSEN (Prussia), May 4, 1874.—*Coal.*—Our Coal companies make a good deal of noise over a purchase, at auction, of 180 railroad cars of ordinary Coal from the new Essen mines, at 21 thalers the 5 tons, but the buyer being a leading house of Ruhrort, interested in a good many Coal mines of note, the transaction may be put down as merely a bull operation, the same as was done two years ago, when the identical firm paid in a similar instance 15 thalers, while the Coal was procurable by others at 12 to 13. There is but a slight demand for Coke, which sells at 10 to 11 silbergroschen, washed, the half hectolitre. In order to convey some idea of the miserable condition in which the Iron industry of Westphalia has been placed, we beg to mention that in the Siegen district fifty blast furnaces have extinguished their fires. Pig Iron is quoted 28 to 34 thalers per ton, without anything transpiring. As regards the immediate future of Coal, we are of opinion that the lowest point has not been reached, and that we shall see prices down to 12 to 13 thalers. We are all the more inclined to think so, as it is a notorious fact that even at the latter figure Coal mining in this portion of Prussia is a remunerative business. The cost of production at the center and at Arenberg averaged, for the year 1873, 9·40 francs per ton, while, with the lower wages established since, it can be produced at a cost of but 7 francs a present, yet the current value is still 10 francs, leaving a margin large enough for a further reduction and yet paying the companies handsomely.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, May 5, 1874.—*Tin.*—The market has been firmer to-day; spot Banca was done at 57 to 59, and May and July auction at 57. Spot Billiton has been closed at 57 guilders.

A Remarkable Blast.

Messrs. A. Hall & Sons, fire brick manufacturers, have handed us the following letter:

THE LACKAWANNA IRON AND COAL CO.,
SCRANTON, PA., May 12, 1874.

Messrs. A. Hall & Sons, Perth Amboy, N. J.:

GENTLEMEN—In reply to your inquiry of the 9th instant, I herewith give you report of our No. 5 blast furnace, which was built with your brick. Blast was put on Oct. 31, 1865, and taken off 10 a. m., May 7, 1874, thus making a blast of 8 years, 6 months and 6 days, making 100,667—3—1—20 iron.

Owing to the extreme dullness of the iron business, it was decided to blow out one of the three furnaces in operation, and to do so with this on account of the *boilers*—otherwise we should probably have kept it in operation, as it was working well to the last.

Yours, respectfully,
(Signed) J. C. PLATT, V. P.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

SHEFFIELD, Eng., May 4, 1874.

GENERAL REMARKS.

As will be seen by the figures given hereinafter, and by some of the facts recorded, the British iron trade is not, on the whole, in a worse condition than it has been any time during the last three months. It will, I think, be also quite as evident that those who are confidently looking forward to a speedy and considerable revival of the iron trade are doomed, if not to ultimate disappointment, to the exercise of patience, and must needs be watchful of the course of events in order that they may take at "the flood" that tide which may lead on to fortune and success. South Staffordshire and Birmingham are still exceedingly disquiet by reason of the prolonged appearance in the very midst of the ironworks of Belgian agents, who are doing a very fair stroke of business, owing to their prices being still £1. 10/ to £2 below Staffordshire quotations for iron of corresponding quality. Scotland is gradually shuffling off the coils which, in the shape of struggles with workmen, have bound down the iron trade of late, and will, in all probability, soon increase the production of pig iron by putting the furnaces again in blast, each individual ironmaster being allowed the option of relighting his furnaces. Barrow-in-Furness is said to be doing a heavy *American* business in steel—presumably in steel rails for *Canada*. Sheffield is what one may term "mixed." Cutlery and the hardware trades are not a whit better, nor does the steel trade improve, but the rail mills are better employed. Middlesboro' is, in the main, inactive and not very hopeful. South Wales is preparing for a struggle in case the miners *will* be stupid, and the ironworks—amongst them the Landore Steel Company—are notifying termination of contracts with the men. The tin plate struggle drags its slow length along, but the limitation of production, so brought about, has no marked effect on prices. In the consideration of the various districts and prices at greater length, I shall first take

SCOTLAND AND THE NORTH OF ENGLAND.

The Scotch pig iron market has remained fairly strong since the date of my last letter, and a moderately large amount of business has been done in some brands, whilst in other cases some little time must necessarily elapse before deliveries can be made, owing to a scarcity of stock. This will, I dare say, be remedied in the course of a few days by putting additional furnaces in blast. Warrants are currently about 7/9. Messrs. William Colvin & Co. (Glasgow), in their latest circular state that "we cannot this week give our usual quotations for the various brands. No. 1, g. m. b., may be quoted 80/ to 81/, and No. 3, 78/ to 79/, but for special brands it is difficult to ascertain the value without actual business. The dispute betwixt the mining population and their employers continues, and, in consequence, a large number of the furnaces still remain idle." This view of the difficulty that exists in securing exact makers' prices is borne out by the remarks of another Glasgow firm, well known in the shipping trade. As evincing the great falling off in one branch of the iron trade, I may mention that since Christmas shipments of Scotch pig iron have fallen off not less than 68,000 tons. The troubles with the miners are, in many districts, gradually wearing out, and the men have resumed, or are ready to resume, work, in the consciousness that they must, willy nilly, assent to the reduction in wages. It is not by any means certain, or even likely, that the whole producing power of any one establishment, or of the trade as a whole, will be for some time to come be put into operation. To do so would be for the makers to cut their own throats. With the present limited production and small stocks it would appear tolerably certain that prices must shortly rise to a remunerative level; whereas, by increasing production to too great an extent, quotations would be held down to figures which are declared to be altogether profitless. Connal's stores now contain but a small stock—something like 40,000 tons—which could not long supply even a very low average demand. The Scotch manufactured iron trade is very dull, and in that respect resembles its *confrere* over the borders. There is a moderate amount of shipbuilding in hand on the Clyde, but no new commissions of any pretensions. I hold in my hand a report from Barrow-in-Furness which states that "more steel is going to America at the present time than at any time since the market across the Atlantic was opened to British manufacturers, and orders are in the hands of local makers which will keep them fully employed for this year, no matter how trade declines." This, I should imagine, refers to the considerable orders for rails which the Barrow Steel Company is working out on behalf of the Grand Trunk Railway, and not to any particular inquiry on behalf of the United States lines, or private consumers. In the neighboring Middlesboro' district there is no valid improvement in pig iron, but prices are momentarily stronger, owing to the serious resistance which the miners of Durham (40,000 in number) are making to the proposal to reduce their wages by 20 per cent. They threaten a strike, and appear so determined that every preparation is being made for a fight on both sides. If they carry out their avowed intention the iron trade of Cleveland will be completely paralyzed. The Darlington Iron Works have secured a good government order for rails for India, and Messrs. Shaw & Thomson, of the Moor Iron Works, Stockton-Tees, have contracted with the agent general for New Zealand for 9000 tons of rails, to be shipped this year. In referring to this latter contract, the London *Times* remarks: "Six weeks ago the Indian government contracted with the same firm for 9000 tons of similar rails, and so considerably have prices fallen during that period that there is a difference in favor of the New Zealand government of £13,500." This represents a fall of £1. 10/ per ton.

SHEFFIELD.

Matters are dull in the cutlery trades, and, with the exception of a few American orders for best razors, carvers and table knives, a moderately good London demand for expensive cutlery *de luxe*, and a light home trade in general classes of pocket cutlery, there is nothing worth alluding to in detail. The scissors manufacturers are only moderately employed—prices, as compared with those of their French and German rivals, being too high to secure bulky orders for common qualities. Spain, the East Indies, and one or two of the larger West India Islands are taking moderate quantities of goods suited to their requirements—Spanish "requirements" apparently being a considerable stock of bowie knives, which are admittedly useful when executing an "insertion" pattern over the person of an antagonist, or when it is absolutely necessary to make a hole in him to let out his superfluous pugnacity. This merely by the way, however. Australia is forwarding us a few desultory orders for table cutlery of good quality, and the same colony, I have good reason for knowing, is taking moderately large lots of stove grates, edge tools and electro-plated goods. This, in a less degree, holds equally true of New Zealand. Some merchants look to these colonies with anxious, albeit hopeful, glances, in the full expectation that their custom will presently so greatly increase as to compensate in a very marked manner for the loss of the American trade. This, indeed, may be so in the course of time, but hardly for many years to come. When New Zealand has developed her resources pretty fully, and has attained the status of a full grown, well governed colony, it is not wholly improbable that she may supply Australia with iron. Who can tell? As regards Sheffield houses, which are almost wholly engaged in the American trade, reports are very doleful, orders being stated to be few, light, and tremendously "mixed," so that they are troublesome out of all proportion to "get up." In the file trade no great stroke is doing, save in Butcher's, and a few best makes. In many instances the workmen are "on stint," and are not permitted to earn more than £1 per week—a pretty safe indication that a good deal of their work is sent into stock. In the heavy trade matters appear a little more hopeful.

Quotations being now much easier for sheet iron, Bessemer steel and rails, with other miscellaneous iron and Bessemer steel articles, it is thought that a fair inquiry may not unreasonably be expected to set in at once in augmentation of and in addition to the usual favors of regular customers.

That this hope is not wholly devoid of foundation is evinced by the fact that, despite the many ugly rumors which are still persistently circulated as to the credit of certain firms, some fairly large sales of Bessemer pig iron, ores, and ironstone have been made here within the past few days at prices which are not lower, on the average, than those current a fortnight back.

It is also an established fact that Russian orders for Bessemer steel and Bessemer steel rails have just come to hand, and being of moderate proportions, will afford the rail mills of one or two leading firms occupation for some months to come. There are also inquiries in the market on behalf of India, Egypt and Italy, and some good specifications are on the point of being placed on account of Australian and New Zealand lines. Sweden and Denmark were believed to be likely to furnish local rail mills with work, but it is now understood that, in the latter case, at any rate, the orders have gone into Scotland.

There is a better inquiry for buffers and tires, but no improvement in the call for miscellaneous accessories. For telegraphic wire there is a steadily increasing demand on account of the home postal telegraph lines, which have been enormously extended since they came into the hands of the government, and for America, Australia, New Zealand, India, the Cape, &c. It is known that for some time past there has been a difficulty in obtaining best Scotch pig iron—such as Coltness and Gartsherrie—for foundry purposes, and much inconvenience has consequently been inflicted upon the numerous founders who have been accustomed to use specific brands which they cannot just now obtain for money. Attempts have been made to procure a substitute, the best of which would appear to be a special make of the Aireside Hematite Iron Company, Leeds, which at present answers all that is required of it. In the Leeds district sheets have been reduced about £1 per ton in order to meet foreign competition, but there—as also in the more immediate locality whence I write—has been no clear official fall in the price of Yorkshire iron. Agents for Staffordshire firms are of course quoting lower prices in consonance with the drop declared in bars and sheets.

The general steel trade is anything but brisk, not a few firms being obliged to carry on a purely "hand to mouth" business. American orders are very light and few in number, except for the finer grades of tool, axe and clock steel. Common steel does not sell at all readily, and, taken altogether, the lookout of this branch of industry is not by any means of a hopeful nature. The great crucible steel casting for the Woolwich new 81-ton gun was run at the works of Messrs. Thomas Firth & Sons, Sheffield, on Friday last. In its production 194 men were engaged, who emptied 628 crucibles, each weighing 70 pounds net, into the casting pit. The weight of the casting in the rough is therefore about 20 tons, its length in the mold being 13 ft. and diameter 42 in. When it has been allowed to cool in a very gradual manner for some time, it will be reheated and well hammered by the 25 ton Nasymth hammers of the firm until it is of proper size and suitable density. It is destined to form the interior or tube for the great piece of ordance alluded to, and is the largest steel casting yet turned out. It will be turned, tempered, &c., at Woolwich. Messrs. Firth's works possess unequalled facilities and appliances for this class of heavy work. The whole of the tubes for large guns for the British government are made by them, as well as the bulk of the barrels for rifles and other steel articles. They have erected two steam hammers of 25 tons each at a cost of over £33,000, and their lathes, boring apparatus, &c., rank amongst the most powerful and best finished of the whole world.

TRADE OF BIRMINGHAM AND STAFFORDSHIRE.

There is much depression in the iron trade proper of these districts, but there is, judging from the latest and best informed local reports, a somewhat greater steadiness of tone this week, albeit there is no really visible improvement to record. There have been no further failures in Staffordshire up to the time of writing, a fact which has a tendency to give rather more confidence to both sellers and buyers. A few slight specifications for special brands of iron have been filled at prices ranging from £11 up to £14, but they are wholly exceptional, as also is the latter price, which is only realized by Messrs. Barrows and Earl Dudley. How it is that this noble iron master—with his enormous stores of coal at the very doors of his works, and many other advantages over the majority of producers—continues to quote £14, or even £13. 12/6, is perfectly inexplicable. Granted that his finished iron is of very superior quality, what is the use of upholding a price at which he cannot sell other than the very smallest lots, and which has a bad general effect on the trade as a whole? There are but few orders for export, although some of the Birmingham merchants have just received a few specifications for hoops for the United States, plates for Canada and sheets for Australia and India. Some of these are not yet placed, and will be withheld until the market assumes a more settled aspect. Prices of bars are £10 to £12 (or £14 for the exceptions named above), sheets to 20 W. G., £14. 10/ to £17; charcoal sheets to 20 W. G., £23; Messrs. Baldwin's B, £19; B B, £20; B B B, £21. 10/; best charcoal, £28. 10/; E B charcoal, £30. 10/; rivet iron, £11 to £14; best do., £13 to £15. 10/; nail rods, £11 to £14; boiler plates, £14. 10 to £17; angle iron, £11. 10/ to £15; band iron, £11. 5 to £13; T's, £14 to £15; ordinary hoops, £12. 10/ to £15. 10/; horse shoe iron, £14, and best £15. 10/; Bessemer steel sheets to 20 W. G., £22, and best slit nail rods, £11. 5/ to £15. As compared with these quotations, the figures at which Belgian agents are securing orders in Staffordshire are worth noting, the figures I now give being those of Messrs. De San & Co., whose works are, I believe, near Liege: Usual good bars (flat, from 1 to 6 in. wide by ¼ in. and upward), £9. 12/; best, £10. 4/, and best best, £10. 16. Rounds and angles same price up to ¾; nail sheets, 6 to 18 W. G., £10, but if cut to lengths, £11. 16/; sheets warranted to flange of the size No. 8 to 18, Birmingham W. G. (but 7 ft. by 3 ft.), £11. 16/, and the different sizes, down to No. 26, at various figures, ranging from £11. 16/ to £16. 12/6. For "best best" qualities £2 extra, and charcoal £5 extra per ton. Boiler and ship plates, 6 to 15 inches wide by 26 feet in length, £11, £11. 16/ and £15. 16/, according to the quality desired. Girder and other similar thick plates, 8 feet long, 4½ feet wide and up to ¼ inch thick, £11. 11., £12. 12/ and £16. 2/. Angles and T's, £10. 16/ for best quality; channel iron, £10. 16/, and rails of any section at from £9. 16/; hoops, up to ¾ in. wide, £15. 20/ for No. 15, and £17. 10/ for No. 20, W. G. These prices are, I should say, free in the Thames at London, or Mersey at Liverpool. Messrs. De San's May circular reports that "a brisk business is doing in Birmingham, on a difference of £2. 10/ to £3. 10/ per ton less than English iron," and ingenuously admits, that "it is with a sensation of relief that they allude to the probable reduction in prices at quarter day not having been realized!" The agent of this firm sold 100 tons of bars at Birmingham on Tuesday at £10. 10/, delivered, and is now opening up negotiations for girder bars and plates to be used in Staffordshire engineering establishments. Thus, as I stated in my last letter, we have convincing proof that there *is* a market for iron in this country, even if we cannot supply it ourselves; yet it is admittedly galling for the foe thus to extend his operations into the very center of the English camp! What part "wages" play in this most important question may be surmised from the fact that last week the Gospel Oak Iron Company (near Worcester) offered to pay their rollers £1 per day; shearers, 15/; and furnacemen, 13/6 per day, at the same time stating they would endeavor to keep them in constant work. The men *rejected* these terms, and the firm have since admitted that at the late 10 per cent. reduction each man *could earn considerably more than the amounts named*. At which rate, I would remark, your modern follower of Cyclops is as well, or even better, paid than the majority of the average professional man of this country. "And still," as Mr. Toole would say, "they are not 'appy!" The hardware industries of Birmingham and the Black Country towns are, taken as a whole, some what quieter, although there is no marked scarcity of money and no particular uneasiness as to the future. Home orders are still the most profitable, especially for white and yellow metal goods, as compared with iron hardwares. There is much depression in the iron tube trade, and the demand for engineering requisites and machinery has considerably abated. There is, nevertheless, a fair inquiry for small driving engines for the north of Europe, and for general railway, dock and other purposes. The nut and bolt makers are busy, and there is a good stroke doing in japanned goods, as well as in the tin plate trade. Brass window fasteners, hinges, toilet ware, traveling boxes, brass cocks and steam fittings are in good request. Jewelry of the kind which "Brummagem" has made its own, is altogether neglected—so much so, in fact, that coy and charming "Brum" begins to fear that fashion is leaving her in the lurch! The electro-platers, both at Sheffield and Birmingham, are busy, and at both towns the edge tool makers are busy on tea plantation hoes, matchets and road making implements for the East Indies.

THE SOUTH WALES DISTRICT.

The iron trade in this locality is very dull, there being no activity worth speaking of, in the proper sense of the word, at any of the works. Nails are nominally quoted at all prices from £8. 5/ up to £10. 10/, the former being manifestly less than the cost of production, or, at any rate, leaving no profit. There are symptoms of coming trouble with the colliers in the Aberdair Valley, as well as in the Dean Forest and other districts, the men appearing determined to resist a reduction in wages, despite the strong recommendation given them by their own leader (Holliday) to accept a fall of ten per cent. The tin plate workers' strike in Carmarthenshire continues. They are supported to the extent of 5/ per week per man by the tin plate workers of Monmouthshire. Prices of these goods are firm, being: I C coke, 29/ to 30/; I X coke, 35/ to 38; I C charcoal, 36/ to 38/; and I X charcoal 42/ to 44/, per box of 225 sheets, in Wales. Despite the lockout and consequent limitation of production, merchants and consumers generally do not appear to have become alarmed, if one may judge by the indication that no extra amount of business is being done. There are, as usual, good consignments to New York, Boston and Philadelphia.

THE METAL TRADE

is easier than at the date of my last letter. Tin and Copper are both down and may fall yet lower. There is a good business doing in quicksilver at £19. 15/ per bottle. Zinc is quoted £27 for London rolled, and star Antimony £50 to £53 per ton. Messrs Von Dadelezen & North's report says: *Copper* has been quiet, and at one moment the nearest quotation for g. o. b. Chili was £73 buyers, £73. 10/ sellers; £74 has, however, since been paid for a considerable quantity, and there are buyers thereat, but sellers are very shy; best brands, £77. The delivery during the last fourteen days was 2500 tons. Wallaroo was sold at £85. 10/ for immediate delivery, and £85 three months fixed. Burra is comparatively cheap, and sold at £83. A fair business doing in English. Tin has been very inanimate, and only small lots sold. Our nearest quotations are £96 for Straits, and £94 for Australian. The delivery in April, 419 tons, was good, considering the lock-out in South Wales. In Holland Banca is quoted 58 fl. spot, and 56 fl. for delivery, ex. May and July sales. Billiton, 54 fl. English is scarce, and steady in price. Common lamb and flag, £102. *Tin Plates.*—But little business doing, owing to difficulty in getting delivery, prices steady. *Lead* rather lower. Good soft English pig, £20. 5/ to £20. 10/; L. B., £20. 10/. *Spelter.*—Nothing reported. *Quicksilver.*—£19. 15/.

Messrs. Vivian, Younger & Co.'s monthly report on the metal market has the following anent Copper and Tin: *Copper.*—The past month has shown a further decline of 50/ per ton in Chili bars, closing at £74, cash terms, for good ordinary brands, with 10/ to 60/ more for special and best marks. The Chili charters for the month of March, as advised by cable, have been heavy. The market rallied a little before the receipt of the last cablegram, and £76, cash, was paid for g. o. bs. In furnace material Regulus has been sold at 15/ per unit. At the Swansea sale, on the 28th inst., 1363 tons ore, average produce 19¾ per cent., realized 14/ per unit, Cape ore bringing 15/0¼. The closing quotations are: Chili bars, £74 to £77, according to brand; ores and Regulus, 14/6 to 15/ per unit; Coro Coro Barilla, 16/ per unit, with rather a better feeling at the close. Transactions for past fortnight are estimated at about 5000 tons Chili bars, the prices being principally on the basis of £73. 10/ to £74 for good ordinary brands. *Tin.*—During the early part of the month an active demand set in, and unusually heavy buying took place for the American market, which resulted in Straits reaching 105/; English smelters, after having sold freely at advancing prices, were obliged to ask prohibitive rates, owing to their inability to make further deliveries promptly; the reaction, however, soon came, and we now have to report a quiet market, with Straits at 96/; English common ingots, 100/; refined, 102/; Peruvian, 75/ to 85/, according to quality.

Prof. Goldwin Smith, a life long free trader, presents the following arguments in favor of a protective tariff for Canada: "We have a surplus population which is constantly emigrating to the States. This population, though apparently not equal to the Anglo-Saxon in farming, is of a race remarkable for textile aptitude, for taste in manufactures, and for ready submission to factory organization. If, by according to our native manufactures the encouragement of a moderate amount of protection, we could induce our French peasantry to remain at home, and to enrich their own country by the produce of their labor, is it certain that we should not be doing that which political economy, as the science of enlightened self-interest, enjoins? Might not all owners of property, and all producers in Canada, be speedily indemnified for a slight temporary sacrifice by a great increase of the prosperity of the country? In adopting such a policy we should, perhaps, be deviating from the general rule which bids us buy in the cheapest market, but should we not be conforming to the higher rule which bids us prefer the greater gain to the less?"

McDONALD & GORDON,

Rushford, Allegany Co., N. Y.

Patentees and exclusive manufacturers of

"THE BOSS" HORSE HAY FORK,

AND

"THE BOSS" GRAPPLE.

☞ Special prices given on Sample Order, and exclusive sale given in a place. For Prices and Descriptive Circular send business card.

POP PRESSES

Bennett Hotchkiss and N. C. Stiles' Patent.

This Drop (which has been illustrated in this journal) is of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of BENNETT HOTCHKISS (who in an interference case with Goulding and Cheney was declared the first inventor) and N. C. STILES. Our improvements consist:

First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place, to a great extent, of all other kinds for forging. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod, the lower end of which is secured to the end of a lever, which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.

Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps situated under the rolls, so arranged that as the hammer ascends they will freely open of themselves, but on descending they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.

Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain *any hight* of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow of less hight than the collar is set for is required, work the hand lever, which will give you any hight of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired hight, so that the next blow can be given from a state of rest, of less hight than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less hight than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.

The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

Manufactured only by the

Stiles & Parker Press Co.,

MIDDLETOWN, CONN.

For Sale, &c.

(*Continued from page 17.*)

FOR SALE.

A clean and complete stock, (say $8000 to $10,000 worth) of **Hardware, Agricultural Implements,** and **Paints** and **Oils,** with the good will of a well established cash business in one of the most substantial and rapidly growing towns in New England. The present owner desires a change solely for reasons of a domestic nature, and offers, to a young man with capital, an opportunity seldom presented. Address,

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Address, **Box 379, Moline, Ills.**

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In **Hartford, Conn.** An old established business. Second to none in the State. Inventories $35,000. Address, **W. F.,**

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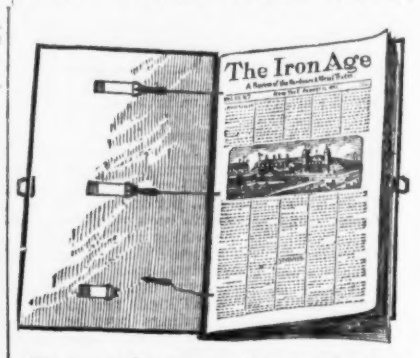
Get Binders

FOR THE IRON AGE.



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Half Cloth.....$1·00 each.
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Half Roan..... 1·75 "
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The above are all in black, which is the most serviceable color, with the exception of the Half Morocco, which are put up in a number of handsome shades. The name of the paper is stamped in gold on either side, and each Binder is furnished with loops by which it can be hung up against the wall as newspaper files are usually disposed of.

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On receipt of the price we will ship them, safely put up, by any express line or to any New York house to be packed. They are too large to be sent by mail.

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The **Asbestos Roofing** is adapted for steep or flat roofs in all climates, and can be cheaply transported an easily applied. Is furnished in rolls containing 200 square feet each, packed in strong skeleton cases.

Asbestos Roof Coating for restoring and preserving roofs. In 5, 10, and 20 gal. kegs and bbls.

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These materials are prepared ready for use, and are put up for shipment to all parts of the world. ☞ Send for descriptive Pamphlets, Price Lists, &c., &c. **Liberal Inducements to General Merchants and Dealers.**

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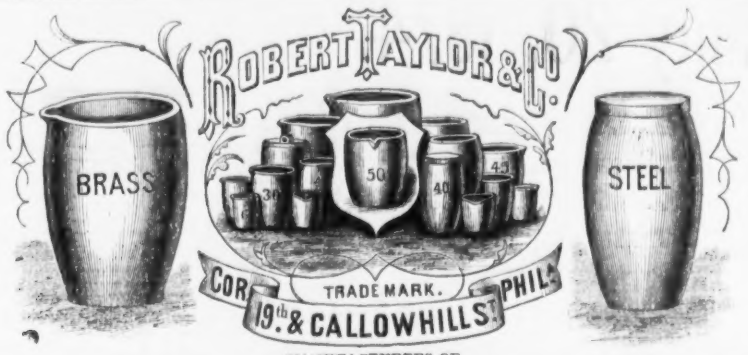

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Of all Sizes and Forms for melting

Steel, Brass, Gold, Nickel and all kinds of Metals.

Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

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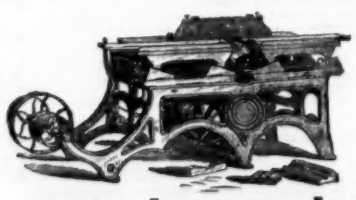

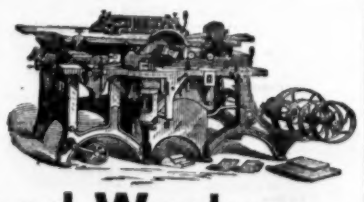

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For Railway Car Builders, Agriculturists, Carriage and Wagon Works, Planing Mills, Sash, Door and Blind, Furniture, Cabinet and Bedstead Factories.

The most useful and labor saving Machine of modern invention, which *has no equal for Variety, Quality and Economy of its Work.* Horizontal and Upright Boring Machines superior to any in use.

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The jaws of **BARBER BRACES** are now made of Cast Steel. This, with other recent improvements, makes them by far the best Brace in market. We are willing to meet prices other manufacturers when their goods are made equal to ours If cheap goods are wanted, our No. 22 and 23 Braces will meet that demand, as we will guarantee them to be better than any other Brace in use, except our first quality. We have made two styles of **Ratchet Braces,** which have been largely sold, and now have a third kind nearly ready which we think is better than either of the others.

Our **BREAST DRILLS** have a chuck with Steel jaws, which will hold round twist drills up to half inch, and will also hold equally well, auger bits with shanks of any shape. The demand for these **BREAST DRILLS** has been so large, that we have not been able to accumulate a stock, but can put in a few with each brace order if wanted.

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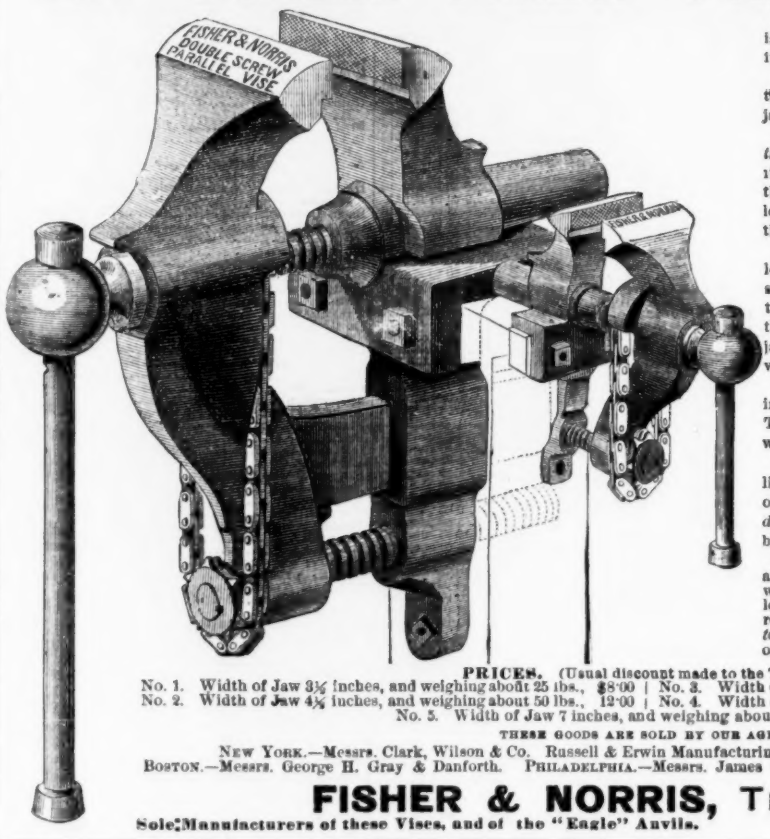

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It is the only one which has all the strength and "grip" of the ordinary English Vise; and at the same time with the jaws *parallel* at every point of opening.

In all other "Parallel" Vises using only one screw, *less than one-third* of the power applied is effective on the work itself; beside, in those vises the large waste of power on the slide from *friction* and the *tendency to "jam,"* of the lower end of the jaw, if screwed up very hard, renders them unfit for heavy work.

In this vise the jaws are kept *always parallel* by the lower screw moving in or out exactly with the upper, lever screw, by means of the chain connecting both: also, by their relative position *two-thirds* of the power applied at the lever screw is received by any piece held between the jaws—thus enabling the heaviest work ever required of a vise to be done with this.

The Screws are forged of the best refined iron, and work in *solid cut thread* boxes. The Jaws are faced with best Tool Steel, welded on, file cut, and properly tempered for wear.

The Chain is very carefully made of case hardened inside links and rivets, and, acting only to *regulate* the position of the lower screw for different points of opening, has *no direct strain* of the work upon it; it is therefore as durable as the other parts.

Only the strongest material is used in this manufacture, and from actual experiment on the six inch jaw vise, which has screws of 1¾ inch diameter and lever 19 inches long, it has been found that applied at the lever Screw, it required to break either of the jaws, *eleven and one-half tons,* thus exhibiting a maximum strength far above any other vise of like size.

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No. 1. Width of Jaw 3½ inches, and weighing about 25 lbs., $8·00 | No. 3. Width of Jaw 5 inches, and weighing about 80 lbs., 17·00
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Reasons why you should Use the Nail Puller.

1st. The edges of the boxes are never split or injured. 2d. No broken Nails in the box or cover. 3d. The box and cover remain sound for future use. 4th. Nails are drawn without breaking or bending. 5th. The box can be opened in half the time required by the old method with chisel or crane. Send for prices, and other information, to our Salesroom,

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COMBINATION BELT PUNCH,

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☞ **BELT PUNCH, KNIFE AND AWL,**

Also, ☞ *Needle for Lacing Rubber Belting,* so combined that each tool does its specific work and not interfere with either o the others.

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Anvils.
Solid Cast Steel ... ℘ ℔ 14c
Wright's ... ℘ ℔ gold 13c; over 250 ℔s 12½c, gold
Armitage's Mouse Hole ... gold 11c
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Apple Parers.
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Snell Mfg. Co. ... dis 15 @ 20 %
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" " No. 1
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" Expansive Hollow Augers ... dis 30&10 %
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Andrews' Bits ... dis 25 %
Clark's Expansive Bits ... dis 15 %
Cook's Patent Augers ... dis 50 %
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Shepardson's Double Cut Bits ... dis 20 %
Griswold's Patent ... dis 20 %
CastSteel Cut Augers ... dis 30&10 %
" Auger Bits ... dis 30&10 %
Gimlet Bits ... dis 10&10 %
Long Augers ... new list dis 30 %
Bonney's Patent Hollow ... $48 per doz—dis 25 %
Stearns' " " ... $48 per doz—dis 25 %
Morse's Bit Stock Drills ... dis 20 %
Nobles Mfg. Co. C. S. Cut Augers ... dis 30&10 %
Watrous Slip Augers ... dis 10 %
Vaughan's Post Hole—
6 in. $23 60; 9 in. $25 per doz ... dis 20 %
Axes.
Blood's ... $12 50 @ 14 00
Hunt's ... ℘ doz $15 00 @ 17 50 net @ dis 5 %
Collins' ... ℘ doz 11 00 @ 15 50 net @ dis 5 %
Hurd's ... ℘ doz 12 50 @ 13 50
Schweitzer Mfg. Co.'s ... ℘ doz 13 00 @ 15 00
Simmons' ... ℘ doz 12 50 @ 14 00
Morris' ... ℘ doz 12 50 @ 13 50
Red Jacket ... ℘ doz 12 00 @ 12 50
Mann's ... ℘ doz 12 50 @ 13 00
Double Bitted ... ℘ doz 21 50 @ 22 00
Lowell Tool Co., "Peerless" ... ℘ doz 13 00 @ 14 50
Underhill's ... ℘ doz 12 50 @ 13 50
" Crown ... ℘ doz 13 00 @ 14 00
John Leverett's ... ℘ doz 12 50 @ 15 50
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" D. B. ... ℘ doz 22 00 @ 23 00
Balances.
Chatillon's / Frary's / Morton's ... } new list dis 15 %
Bands.
Plated ... new list dis 50&5 %
Iron Rim ... new list dis 25&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Oroide ... new list dis 50&5 %
Bells.
Hand, Light Brass ... dis 60&10 @ 65&10 %
White Metal ... dis 50&10 %
Swiss ... dis 50 %
Globe ... dis 15&10 %
Abbe's ... dis 10&10 %
Taylor's Patent Door ... net
Western Gong ... net
Brook's Crank ... dis 10 %
" Pull ... dis 15&10 %
Hart Mfg. Co., Crank and Pull ... dis 50&10 %
Cow—Common Wrought ... dis 20&10 %
Western ... new list dis 20&10 %
Kentucky "Star" ... new list dis 20&10 %
Dodge's Genuine Kentucky ... new list dis 35 %
Yaw's Genuine ... dis 20 %
Texas ... dis 30 %
Call ... dis 15 %
Bellows.
Blacksmiths' ... dis 15 %
Moulders' ... dis 15 %
Hand Bellows ... dis 10 %
Blind Fasteners.
Van Sand's ... ℘ gross $14 00
Washburn's Patent ... ℘ gross 14 00
Merriman's ...
Blind Staples.
Boardman's Patent, ⅜ in. and larger ... ℘ ℔ 37 c
" 5-16 in ... " 42 c
Bolts.
Carriage and Tire, Ætna Nut Co. ... dis 60 %
Stove, Ætna Nut Co. ... dis 10&5 %
Cast Iron Barrel, Shutter, &c. ... new list dis 60&10 %
Wrought Iron Barrel ... new list dis 50&10 %
" " Square ... new list dis 50&10 %
Wrought Iron Flush ... dis 15 %
Carriage and Tire, Common ... dis 70&10&5 %
" " " Norway Iron ... 50&10 %
Star, Philadelphia ... dis 50 @ 50&10 %
Eagle, Philadelphia ... dis 50 @ 50&10 %
Philadelphia Pattern, P. S. & W. ... dis 50&10 %
Tire, Bessemer Steel, Hubbard & Curtiss ... dis 50 %
Carriage and Tire, R. B. & W. ... old list dis 50&5 %
Plow, R. B. & W. ... dis 30 %
Stove, R. B. & W. ... dis 10 %
" Shelton Co. Shaved Heads ... dis 15 %
Union Nut Co., old list ... dis 50&20 %
" " Stove ... dis 15 %
Machine ... dis 30&10 @ 40 %
Borax.—In cases of 100 lbs ... ℘ ℔ 18c
Boring Machines.
Kellogg's ... dis 15 %
Snell Mfg. Co., Rice's Patent ... dis 15 %
" " Regular ... dis 15 %
Douglas Mfg. Co. ... dis 20 %
Morticing Machines each ... $18 00
Bow Pins ... dis 50 %
Braces.
Barber's Patent ... dis 40&5 %
Q. S. Backus ... dis 40&10 %
Wilson Mfg. Co. ... new list dis 10 %
Spofford's Patent ... dis 40&5 %
Noble's Patent ... dis 40&5 %
Bartholomew's American Ball ... dis 10&10 %
" Patent Grip ... dis 40 %
Ives' Novelty ... dis 40&5 %
Bull Rings ... dis 50 %
Bung Hole Borers.
Common and Ring ... dis 25 %
Enterprise Mfg. Co. ... dis 20&10 %
Ives' Tap Borers ... dis 25 %
Butchers' Cleavers.
Bradley's ... dis 25 %
Beatty's ... new list dis 10 %
2 3 4 5 6 7 8 9
$19·00 $21·50 $24·00 $27·00 $30·00 $33·50 $36·50 $40·00
Hart Mfg. Co. ... dis 45&10 %
0 1 2 3 4 5 6
$25·25 $29·75 $30·25 $38·75 $43·55 $48·50 $54·00
Butts.
Wrought Brass ... new list dis 30 %
Cast Fast Joint, Narrow ... dis 50 %
" " Broad ... dis 50 %
Cast Loose Joint ... dis 60 %
" " Mayer ... dis 50 %
" " Parliament ... dis 50 %
Loose Pin ... dis 40&10 %
Wrought Fast Joint, Narrow ... dis 30 %
Wrought Broad ... dis 35 %
" Loose Joint ... dis 35 %
Wrought Table and Back Flaps ... dis 30 %
Palmer Blind Butts ... dis 30&10 %
Nicholson Blind Butts ... dis 40&10 %
Parker's Blind Butts ... dis 50 %
Hutter's Blind Butts ... dis 30&10 %
A. S. Parker's ... dis 40&10 %
Clark's Surface Blind Hinges, Nos. 1, 3 and 5 ... dis 50 %
" " " " No. 20 ... dis 55&10 %
" Mortise " No. 2, 4, 4½, 6, 8, 10 ... dis 35 %
Seymour's ... dis 40&10 %
Shepard's ... dis 50 %
Garretson's ... No. 1, dis 50&10 %; Nos. 2 and 7, dis 50 %
The American Spiral Spring Butt Co. ... dis 20 %
Standard ... dis 50 %
Caps—Percussion, per 1000.
G. D. ... 40c
Ely's E. B. ... 1-4s. 58c.; 1-10s. 65c., gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·52½c., gold
Colt's ... 1-10s 70c., gold
Cartridges.
Metallic ... dis 50 @ 50&10 %
Cards.—Horse and Curry ... dis 25&10 %
Cotton ... new list dis 10&10 %
Wool ... new list dis 10&10 %
Carpet Stretchers.
P. S. & W. ... per doz $2 00; dis 33⅓ %
Casters.
Iron and Wood Wheel, Bed ... dis 30&10 %
Brass and Porcelain Wheel, Bed ... dis 30&10 %
Deep Socket, Bed ... new list dis 20&10 %
Iron and Wood Wheel Plate ... new list dis 33⅓&10 %
Brass Wheel Plate ... new list dis 33⅓&10 %
Porcelain Wheel Plate ... new list dis 33⅓&10 %
Cattle Leaders ... dis 50&10 %
Chain
English Coil, by the cask ... net gold
℘ ℔ ... .13 9¾ 9 8½ 8¼ 8c
3-16 ¼ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2 ... by the cask, ℘ pair, gold, 60c
Trace, 7-10-2 ... by the cask, ℘ pair gold, 65c
Galvanized Pump Chain ... ℘ ℔ 13c
German Halter Chain ... new list, Jan. 1, dis 10 %
German Coil ... new list, Jan. 1, dis 10 %
Jack Chain, Iron ... dis 50 %
" Brass ... dis 40 %
Chalk.
White ... ℘ gross, 50c
Red ... ℘ gross, 75c
Blue ... ℘ gross, 90c
Crayons ... ℘ gross, 14c
Cherry Stoners.
"Family" ... ℘ doz $9·00
Chisels.
Socket Firmers ... dis 60&10 %
Socket Framing ... dis 60&10 %
Socket Corner ... dis 60&10 %
Tanged Firmers ... dis 40 to 40&10 %
Butcher's ... $5 50 to £ gold—new list
Newbould's ... $5·50 to £ gold
Spear & Jackson's ... $5·50 to £ gold—new list
Clips, Axle.
Norway or Best ... dis 30 %
Superior ... dis 50 %
"Star," Superior Philadelphia ... dis 45&5 %
Coal Shovels.
Iron Handled ... ℘ doz, $ 85 @ 1 25
Wooden Handled ... ℘ doz, 1 00 @ 2 00
Coal Hods.—Smith, Burns & Co. ... dis 35 %
No. 14 15 16 17 18
Japanned ... $9·00 9·75 10·50 12·00 13·50 per doz
Galvanized ... 13·00 14·50 15·50 17·50 19·50 "
Morning Glory ... dis 30 %
No. 15 16 17
Japanned ... $12·50 13·50 15·50 per doz
Galvanized ... 18·00 19·50 21·00 "
Cockeyes ... dis 30 %
Cocks.
Brass Racking ... dis 25&10 %
Lock and Globe ... dis 25&10 %
Coffee Mills.
Board and Box ... dis 15 %
Increase Wilson's ... new list dis 15 %
Selsor's Pat ... $9·50, $10·50—dis 25 %
French Steel ... dis 15 %
The Swift ... dis 25 %
"American" ... dis 20 %
Enterprise Mfg. Co. ... dis 20&10 %
Diamond, per doz $4 00 ... dis 10 %
Compasses and Dividers.
Bemis ... dis 35 %
Excelsior ... dis 30 %
Peck Stow & Wilcox ... dis 25 %
Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 20 @ 25 %
Swan & Brombacher ... dis 15 @ 20 %
Corn Knives and Cutters.
Bradley's ... dis 10 %
Crow Bars.
Cast Steel ... ℘ ℔ 11c.net
Iron, steel points ... ℘ ℔ 7c
Crucibles.
Gautier & Co. ... ℘ No. 5½c
Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass ... dis 15 %
Fitch's ... dis 15&10 %
Rubber ... ℘ doz, $9·00—dis 15 %
Schweitzer Mfg. Co. ... dis 20 %
Curtain Pins.
Silvered Glass ... old list dis 45&10 %
Cutlery.
American Table ... net list
American Pocket ... dis 25 %
Dog Collars.
Embossed Gilt ... dis 15 %
Leather ... dis 20 %
Door Springs.
Gray's ... $7·50 per doz—dis 40&10 %
Torrey's Patent ... $7·50 ℘ doz—dis 40&10 %
Palmer's Japanned No. 6 ... ℘ doz $5·00
" Coppered " ... " 6·00
" Silvered " ... " 8·00
Challenge.—
Japanned ... ℘ doz $4 00 @ 6 00
Bronzed ... ℘ doz 5 00 @ 7 00
Nickel Plated ... ℘ doz 6 50 @ 9 00
1 Gross lots ... dis 10 %
5 Gross lots ... dis 20 %
Drawing Knives ... dis 60 @ 60&10 %
Bradley's ... dis 25 %
Adjustable Handled ... dis 10 %
Drills.
Ingersoll's Ratchet ... dis 25 %
Moore's Triple Acting Ratchet ... dis 20 %
Whitney's Ratchet ... dis 20 %
Blacksmiths' ... each $3 25 net
Drug Mills.
American Drug Mills ... dis 20 %
Egg Beaters.
Monroe's ... ℘ doz net $8·25 @ 8·50
Dover ... ℘ doz net $6·00
National ... ℘ doz $4·50—dis 10 %
Peerless ... ℘ doz net $4·00
Emery.
Genuine Chester—Regular Nos. ... ℘ ℔ 7c } dis 5 @ 10 %
" Flour and FF ... ℘ ℔ 4c }
Washington Mills—Regular Nos. ... ℘ ℔ 8c
" Flour ... ℘ ℔ 5c
Enameled and Tinned Ware.
Kettles ... dis 20 @ 25 %
Sauce Pans, Glue Pots, &c. ... dis 15 %
Escutcheons.
Brass Thread ... dis 60&10 %
Faucets.
Cork Lined, Wood ... dis 60 %
Fenn's ... dis 50 %
" Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 10&10 %
Taylor's Pattern " ... dis 20&10 %
Wood and Metallic ... dis 40 %
Felloe Plates ... ℘ ℔ 14c; dis 10 %
Files.
Nicholson ... $5 00 to £ currency—dis 10 %
Newbould's ... 5 25 to £ gold
J. & Riley Carr's ... 5 50 to £ gold
" " Rasps ... 5 75 to £ gold
Stubs' ... 8 50 @ 9 00 to £ gold
Butcher's ... 5 50 to £ gold
Walter Spencer & Co.'s "Diamond" ... 5 25 to £ gold
Spear & Jackson's ... 5 50 to £ gold
Hargreaves, Smith & Co.'s ... 5 00 to £ gold
Jowitt's ... 5 25 to £ gold
"Western" ... 5 00 to £ net
W. K. & C. Peace's "Imperial" ... 5 25 to £ gold
R. Ibbotson ... 5 00 to £ gold
Beam & Murray, "Cyclops" ... 4 85 to £ gold
Fisher's ... 4 75 to £ gold
Goodlad's ... 5 00 to £ gold
Moss & Gamble ... 5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 5 00 to £ gold
" Horse Rasps ... 5 50 to £ gold
Floral Tools ... dis 25 %
Fluting Machines.
Mrs. Coles, 7 inch rolls ... 6 50
" " 5 " " ... 5 50
Knox, with 4-inch Rolls ... 5 00 each net
" " 6 " " ... 6 00 each net
O. K. ... 6 50 each net
Peerless, 4-inch Rolls ... 4 00 each net
" 5 " " ... 5 00 each net
Excelsior, No. 1 ... 4 75 each net
" No. 2 ... 6 50 each net
Diamond ... 7 50 each net
Climax 7-inch Rolls ... 8 00 each net
" 4½ " ... 6 50 each net
Empire ... 4 00 each net
Eureka, No. 1, 7-inch Roll ... 8 00 each net
" No. 2, 5-inch Roll ... 6 00 each net
K. F. M., 4½-inch Roll ... 5 50 each net
" 6-inch Roll ... 6 00 each net
Myers' Fashion Fluter, 4½-inch Rolls ... 3 00 each net
" Convex Brass Fluter, Sad Iron attachment ... $1·75
Domestic Fluter ... $1·75 each net
Fairy, Self-Heater ... 8 00 each net
Geneva Hand Fluter ... $15 00 per doz net
Champion, 6 inch rolls ... $6 00 each net
" 4 inch rolls ... $5 00 each net
Forges.
Keystone Portable Forge Co.'s ... dis 20 %
Forks.
Hay, Manure & Spading ... dis 25 %
Plated A 1 ... dis 30&5 %
Freezers.
Champion ... dis 33⅓
Torrey's ... dis 50 %
Fry Pans.—P. S. & W.
Tinned ... dis 25 %
℘ doz ... $3·00 3·25 3·62 4·00 4·50 5·00 5·50 6·00 7·50
No. ... 0 1 2 3 4 5 6 7 8
Smith, Burns & Co., "Excelsior" Polished ... dis 35 %
℘ doz ... $3·70 4·00 4·70 5·30 6·00 7·00 8·00 9·00
No. ... 1 2 3 5 6 7 8
Gauges.
Marking ... dis 45&10 %
Wire ... dis 10 %
Hammers.
Emmet Hammer Co. ... dis 10 %
Maydole's ... dis 5 %
Cheney's ... new list net
Verree ... dis 5 %
Yerks & Plumb ... new advanced list dis 5 @ 10 %
Minot & Co. ... dis 15 %
Magnetic Tack ... dis 20&10 %
Handles.
Hammer and Hatchet ... dis 10 %
Quakertown, Axe, Pick and Sledge ... dis 10 %
" Hammer and Hatchet ... net
Greensboro', Axe, Pick, Hammer, &c. ... dis 10 %
Woolworth Axe, Pick and Sledge ... dis 10 %
Brad Awl ... per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 10&10 %
" " " large " 6 25—dis 10&10 %
Apple " " ass'td " 6 00—dis 10&10 %
" " " large " 7 00—dis 10&10 %
Socket " " ass'td " 3 50—dis 10&10 %
" Framing " " " 6 00—dis 10&10 %
File ... " " 3 50—dis 10&10 %
Auger ... " " 5 50—dis 10&10 %
" large " 6 50—dis 10&10 %
Hangers.
Barn Door ... revised list dis 60&10 %
"Anti-Friction" (Rider, Wooster & Co.) ... dis 30 %
Novelty ... dis 30 %
Harness Snaps.
Henshaw's ... dis 25&10 %
Judd's ... dis 40 %
Fitch's ... dis 30 %
Hotchkiss' ... dis 30 %
Andrews' ... dis 25 %
Sargent's ... new list dis 50&10 %
Hatchets.—Isaiah Blood ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 50 8 00 8 50
Claw, " 1 2 3 ... ℘ doz 8 50 9 00 9 50
Lathing, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Hunt's ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ... ℘ doz 7 50 8 25 9 00
Hurd's ... dis 20 %
Shingling, Nos. 1 2 3 ... ℘ doz $8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $6 50 7 00 7 50
Claw, " 1 2 3 ... ℘ doz 7 25 7 75 8 25
Lathing, " 1 2 3 ... ℘ doz 6 50 7 00 7 50
Yerks & Plumb ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ... ℘ doz 7 00 7 50 8 00
Simmon's ... dis 15 %
Shingling, Nos. 0 1 2 3 ... ℘ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Broad, " 1 2 3 ... ℘ doz 9 00 10 00 12 00
" " 4 5 6 ... ℘ doz 14 00 16 00 18 00
" " 7 8 ... ℘ doz 20 00 22 00
Elephant ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
J. P. Verree & Co. ... dis 5 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ... ℘ doz 7 00 7 50 8 00
Underhill's ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz 7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 ... ℘ doz 11 00 12 00
Hinges.
Wrought Strap and T ... dis 20&10 %
Providence Plate. { 6 and 8 in. list 11c. / over 8 in. list 9½c. } ... dis 20 %
Screw Hook and Strap { 8, 10, 12 in. 8c / 14 to 36 in. 6½c } ... net
Heavy Welded Hook { 8 to 12 in., 9c / 14 in. & up, 8½c } dis 10 %
Screw Hook and Eye { ⅝ to 1 in., 9½c / ½ in. 10½c / ⅜ in. 12½c } ... net
Hoes.
Solid Shank, C. S. ... ℘ doz $8 00—dis 20 @ 30 %
Socket ... ℘ doz 9 00—dis 20 @ 30 %
Riveted Eye ... ℘ doz 5 00—dis 20 @ 30 %
Grub ... dis 20 %
Planters'—Winsted ... add 10 %
Scovill ... add 33⅓ %
Scovill Pattern (Winsted) ... add 20 %
Hooks.
Belt ... dis 50 %
Clothes Line ... dis 60&10 %
Bench—Skinner's ... per doz $8 00, dis 30 %
Bench—Hotchkiss' $5 00 ℘ doz ... dis 10 %
Bench—Weston's No. 1, $8·50; No. 2, $7·00 per doz net
" —McGill's ... $3 00 per doz, dis 10 %
Wardrobe, Japanned ... new list dis 60&10 %
Hat and Coat " ... new list dis 60&10 %
Wrought Staples and Hooks and Staples ... dis 60, 10&10 %
Screw Hooks and Eyes, revised list ... dis 70 %
Grass ... dis 25 %
Whiffletree—Patent ... dis 30 %
Hooks and Eyes—Malleable Iron ... dis 50 %
" " Brass ... dis 50&10 %
Horse Nails.
Putnam's.
No. ... 5 6 7 8 9 10
32c 28c 26c 25c 24c 23c
In lots 2000 lbs. dis. 5 %.
Ausable
No. ... 5 6 7 8 9 10
30c 21c 25c 24c 23c 22c
Pointed & finished ... 31c 28c 26c 25c 24c 23c
In lots of 1000 lbs. 5 % discount.
Brundage.
No. ... 5 6 7 8 9 10
29c 26c 24c 23c 22c 21c
In lots of 500 lbs., dis. 5 %.
American Pressed.
No. ... 5 6 7 8 9 10
21c 20c 20c 20c 20c 20c
In lots of 1000 lbs. dis 5 %.
Perkins Finished (ready to drive).
No. ... 5 6 7 8 9 10
31c 28c 26c 25c 24c 23c
In lots of 1000 lbs. dis 5 %.
Buffalo Forged.
No. ... 6 7 8 9 10
28c 26c 25c 24c 23c
Globe (Pointed and Polished).
No. ... 5 6 7 8 9 10
31c 28c 26c 25c 24c 23c
In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished).
No. ... 5 6 7 8 9 10
Patent Finish ... 28 25 23 22 21 20
Extra " ... 30 27 25 24 23 22
In lots of 1000 lbs., dis 5 %.
Vulcan (Blued, pointed, ready to drive).
No. ... 5 6 7 8 9 10
33c 30c 28c 27c 26c 25c
In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.
New London Horse Nails.
No. ... 6 7 8 9 10
Great Western ... 27c 25c 24c 23c 22c
U B ... 29c 27c 26c 25c 24c
In lots of 1000 lbs., dis 5 %.
Star Brand ... ℘ ℔ 16c
Morgan ... 14c
Horse Shoes.
Burden ... ℘ keg, $5 87½
R. I. Horse Shoe Co., Perkins Pattern ... ℘ keg, 5 87½
" " R. I. Pattern ... ℘ keg, 6 37½
Mule Shoes ... ℘ keg, 6 87½
Ice Picks.
Iron ... ℘ gross $12 00 @ $16 00 net
White's ... per doz $2 50 dis 10 %
W. H. ... per doz 1 60 dis 10 %
Dunlap's ... per doz 3 00 net
Kettles.
Brass ... ℘ ℔ 55c net
In lots of 500 ℔s ... ℘ ℔ 50c net
Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
Hay and Straw, "Wadsworth's" ... dis 20 %
Knobs.
Base—Common ... net
" Plush Tip ... dis 10 %
" Elastic End ... reduced list dis 10&10 %
Ladles.
Melting ... dis 20 %
Lanterns.
Brady's Patent ... dis 10 %
Ætna ... dis 10 %
Yankee ... dis 10 %
De Beque ... dis 10 %
Locks and Latches.
Cabinet—Eagle ... dis 25 %
Cabinet—Gaylord ... dis 25 %
Trunk ... dis 10 %
Continental ... dis 15 %
Shepardson's ... dis 20 %
American Lock Co. ... dis 33⅓ %
Plate ... dis 25 %
Pad ... new list dis 50, and 2 % for cash
Barnes & Deitz ... dis 25 %
Yale Lock Co. ... dis 40 %
Sargent & Greenleaf ... dis 20 %
Trenton Lock Co. / Branford / Norwich / Russell & Erwin / Norwalk / Nashua / Mallory, Wheeler & Co. / P. & F. Corbin / Parker & Whipple / Jacobus & Nimick Mfg. Co. } New list dis 45 %. 2 % extra for cash.
Mallets.
Hickory and Lignumvitæ ... dis 10&10 %
Meat Cutters.
Dixon's (P. S. & W.) ... dis 10 %
No. ... 1 2 3 4
℘ doz. ... $14 00 $17 00 $19 00 $30 00
Hales' ... dis 25 %
No. ... 11 12 13
℘ doz. ... $27 00 $33 00 $42 00
Miles Challenge ... dis 20 %
No. ... 1 2 3
℘ doz. ... $22·00 $30·00 $40·00
Perry's Champion (P. S. & W.) ... dis 10 %
No. ... 200 300 400
℘ doz. ... $22 00 $27 00 $40 00
Woodruff's (P. S. & W.) ... dis 10 %
No. ... 100 150
℘ doz. ... $15 00 $18 00
American ... dis 25 @ 25&5 %
No. ... 1 2 2½ 3 4 5
Each ... $6 00 $9 00 $14 00 $15 00 $30 00 $75 00
Molasses Gates.
Stebbins' Pattern ... dis 60&10 %
Tinned ends ... dis 40&10 %
Patent Self-Measuring ... per doz $42 00—dis 20&10 %
Bush's ... dis 20 %
Lincoln's ... dis 50&10 %
Mortars and Pestles.
Iron ... net
Mouse Traps.
Wood Choker ... ℘ doz holes, 16 @ 18c
Round, Wire ... ℘ doz $1 50 to 2 00 net
Square, " ... ℘ doz 2 00 to 2 50 net
Cage, " ... ℘ doz 2 50, dis 10 %
Mowers, Lawn.
Excelsior ... dis 25 %
Nails.—See Trade Report.
Nuts and Washers.
Nuts ... large, 5½c; small, 7½c off list.
Washers ... large, 7c; small, 9½c off list.
Oil Stones.
Washita No. 1 ... ℘ ℔ 22c
" Slips ... ℘ ℔ 45c
Washita No. 2 ... ℘ ℔ 17c
Arkansas ... ℘ ℔ 1 25
Hindostan ... ℘ ℔ 6c dis 10&10 %
" Slips ... ℘ ℔ 10c dis 10&10 %
Oilers.
Olmsted's ... new list dis 25&10 %
Broughton's ... dis 25&5 %
Malleable ... per doz $5 00 dis 10 %
Common Tin ... dis 30 %
" Zinc ... dis 30 %
" Brass and Copper ... dis 30 %
Picks.
Washoe R. R. ... dis 25 % ... Nos. 1 3 4 5
℘ doz ... $14·00 15·00 16·00 17·00 18·00
Washoe Coal, dis 20 % ... $8·50 9·00 10·00 11·00 13·00 15·00
Extra 10 % dis 25 doz in 6 months, ending Jan. and July.
Picture Nails and Knobs.
Richards' Patent ... dis 40 @ 40&10 %
Pinking Irons ... per doz $3 00—dis 60&10 %
Planes.
Chapin's, 1st quality ... dis 30 %
Sandusky Tool Co., 1st quality ... dis 30 %
" " 2d " (Ogontz) ... dis 40 %
Ohio Tool Co., 1st quality ... dis 30 %
" " 2d quality (Sciota) ... dis 40 %
Owasco Tool Co., 1st quality ... dis 30 %
" " 2d quality ... dis 40 %
Howland's. 1st quality ... dis 30 %
Bailey's Patent Adjustable ... dis 20&10 %
Plane Irons, Butcher's ... $5 50 to £ gold—new list
" Chapin's ... dis 10&10 %
" Ohio Tool Co. ... dis 10 %
Plane Irons, Spear & Jackson's ... 5 50 to £ gold—new list
" Sandusky Tool Co ... dis 10 %
Pliers.
Button's Patent ... dis 33⅓ %
Plumbs and Levels.
Chapin's ... dis 60&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
Stanley Rule and Level Co. ... dis 60&10 %
Pumps.
Douglas Cistern, etc. ... new list dis 25 %
" S. & F. ... new list dis 20 %
Rakes.
Cast Steel ... dis 30 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.
Malleable ... dis 30 %
$5 00 5 50 6 00 6 50
9 11 13 15 teeth.
Razor Straps.
Genuine Emerson ... dis 25 %
Hunt's ... dis 35 %
Chapman ... dis 10 @ 15 %
Rivets.
Iron and Tinned ... dis 25 %
In bulk ... list net
Copper Rivets and Burrs ... new list dis 25 %
Rods.
Stair ... new list dis 30 %
American Patent ... dis 30 %
Rollers.
Barn Door ... revised list dis 60&10 %
Rope. ... Manufacturers' List
Manila ... ½ inch and larger ℘ ℔ 17 c
" ... ⅜ inch ℘ ℔ 17½c
" ... ¼ and 5-16 inch ℘ ℔ 18 c
" Lath Yarn, Fine Tar'd ... ℘ ℔ 18 c
" Hay Rope ... ℘ ℔ 13½c
Sisal ... ½ inch and larger ℘ ℔ 14½c
" ... ⅜ inch ℘ ℔ 15 c
" ... ¼ and 5-16 inch ℘ ℔ 15½c
" Hay Rope ... ℘ ℔ 15 c
Rules.
Chapin's Boxwood ... dis 60&10 %
" Ivory ... dis 50&10 %
Hubbard & Curtiss Mfg. Co. ... new list net
Stanley Rule and Level Co.'s Ivory ... dis 50&10 %
" " " Boxwood ... dis 60&10 %
Standard Rule Co.'s Boxwood ... dis 60&10 %
" " " Ivory ... dis 50&10 %
Sad Irons.
... ℘ ℔ 4½c net
Sad Iron, Nickel Stand attached ... ℘ ℔ 9c
Sand Paper—dis 7½ @ 10 %
Beader & Adamson's (Flint) 00 to 1½ ... $4 25 ℘ ream
" " " 2, 2½ & 3 ... 4 75 "
Assorted ... 4 25 "
Star ... ℘ ream $3 25
Emery ... ℘ ream $6 50 @ 11 50
Cowdin Mfg. Co. ... dis 7½ @ 10 %
Diamond Flint, 00 to 1½ ... per ream $4 25
" " 2, 2½, 3 and assorted ... 4 75
" Emery Paper ... per ream $6 50 to $11 50
Sash Locks.
Clark's, Nos. 1 and 2 ... dis 33⅓ %
Ferguson's ... dis 33⅓ %
Norwich ... dis 15 %
Walker's ... list net
Sash Weights.
Solid Eyes ... ℘ ℔ 2½c
Sausage Fillers.
Perry's (P. S. & W.) ... dis 10 %
No. ... 1 0
℘ doz. ... $15 00 $21 00
Saw Rods ... dis 10 %
Saws.
Spear & Jackson's ... $4 50 to £ gold
John Spear ... $3 60 to £ gold
Am. Saw Co. ... new list
Perforated Cross Cuts, all kinds ... 68c ℘ foot
Inserted Tooth ... dis 10 %
All else ... dis 12½ %
Disston's Circular ... dis 20 %
" Mill ... dis 25 %
" Cross Cut ... dis 15 %
" other kinds ... dis 12½ %
Livingston's Framed Wood ... dis 5 %
H. W. Peace's Circulars ... dis 10 %
Other kinds ... dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular ... new list dis 15 %
Wm. McNeice's Patent Pole Pruning Saw ... dis 10 %
" " " Compass Saw ... net.
E. M. Boynton's Lightning, dis 30&5 % for immediate cash
" " Others ... dis 15 %
Saw Sets.
Hart's Patent ... dis 15 %
Nash's ... dis 20 %
Bemis' ... dis 10 %
Aiken's Genuine ... dis 25 %
Hotchkiss' ... dis 10 %
Common Lever ... per doz $1 80 net
Leach's ... dis 15 %
Scales.
Turnbull's ... dis 15 %
Brown's ... dis 25&5 %
Fairbanks' ... new list dis 15 @ 20 %
Howe's ... dis 15&5 %
Shattuck's Counter and Union ... dis 15 %
Chatillon's Grocers' ... dis 25 %
Eureka ... dis 25 %
Scale Beams ... dis 25 %
No. 1 300 to 1200 lbs. ... 90c ℘ cwt
No. 2 " " ... 75c ℘ cwt
Screws.
American list of Jan. 1, 1874.
Flat Head Iron ... dis 52½ %
Round Head Iron ... dis 50 %
Flat Head Brass ... dis 52½ %
Round Head Brass ... dis 50 %
Round Head Silver Capped ... dis 25&10 %
Hand Rail ... dis 33⅓ %
Coach or Lag ... dis 30&10 @ 40 %
Coach, Patent Gimlet Point ... dis 5 %
Bed ... list net
English—Nettlefold & Chamberlain's Flat Head Iron ... dis 52½&10 %
Machine—Flat Head, Iron ... dis 60 %
" " Brass ... dis 10 %
Round Head, Iron ... dis 55 %
" Brass ... net
Bench—Iron, Wilson's ... dis 20 %
" —Wood ... dis 15 %
Hand ... dis 25&10 %
Jack—Bell Bottom ... dis 15 %
Scythes.
Blood's German Steel, Grass ... ℘ doz $9 00
" Cast " " ... ℘ doz 10 00
" Silver " " ... ℘ doz 11 00
" German " Grain ... ℘ doz 13 00
" Cast " " ... ℘ doz 14 00
" Red Rover ... 12 00
" Young America ... 9 50
" Silver Clipper ... 12 63
Scythe Snaths ... dis 20 %
Sieves.—Mann's Patent ... dis 15 %
Shears.
Cast Steel ... dis 60&10 %
Conn. Cutlery Co., new brand ... dis 60 %
Rowe's ... dis 50&10 %
Shovels and Spades.
Ames ... new list dis 12½ %
Rowland ... dis 20&5 %
Old Colony ... new list dis 10&5 %
N. B. Sherman ... new list dis 12½ %
Shovels and Tongs.
Iron Head ... list net
Brass Head ... dis 5 %
Polished Steel ... new list dis 15 %
Slates.
Square Frames, Round Cornered, by case ... dis 60&10 %
Less than a case ... dis 50 @ 55 %
Oval Frames, by case ... dis 40 @ 40&10 %
Less than a case ... dis 30 %
Spoons.
Iron ... new advanced list, dis 10 %
By the case ... dis 20 %
Britannia ... dis 40@40&10 %
Plated A 1 ... revised list dis 30&5 %
German Silver ... revised list dis 15&5 %
Tinned (P. S. & W.)—
Teas ... $1·50 ℘ gross, net
Tables ... 2·75 " net
Stocks and Dies.
... dis 15 %
Stove Polish.
Gem ... ℘ gross $5 00, dis 10 %
Joseph Dixon's ... ℘ gross, 6 00
Gold Medal ... ℘ gross $6 00, dis 15 %
Squares.
Steel ... dis 30 %; full cases, dis 30&10 %
Iron ... dis 50 %; full cases, dis 50&10 %
Nickel Plated ... add $2 50 @ $4 00 ℘ doz net
Try Squares and T Bevels ... dis 45&10 %
Star Try Squares and Bevels ... dis 30 %
Tacks.
Full Weight American Iron ... dis 40&7½ %
Half Weight American Iron ... dis 70&7½ %
Carpet ... dis 7½ %
Brads American Half Weight ... dis 50&7½ %
Finishing Nails ... ⅜ ½ ¾ 1 1½ in. and over
℘ ℔ ... 25c 20c 18c 14c 13c dis 7½ %
Trunk and Clout ... ⅜ ½ ¾ 1 1½ in. and over
℘ ℔ ... 25c 20c 18c 14c 13c dis 7½ %
Copper Tacks ... ℘ ℔ 50c—dis 7½ %
Iron Shoe Nails, ℘ ℔ 4-8 and longer, 10c; 3½-8, 10½c ... dis 7½ %
Double Pointed ... new list dis 33⅓ %
Tapes, Measuring.
American Flask and Cap Co. ... dis 20 %
Eddy's ... dis 20 %
Thermometers.
Tin Case ... dis 50 %
Toe Calks.
... ℘ ℔ 13c net
Tobacco Cutters.
Champion ... dis 20&10 %
Peck, Stow & Wilcox ... dis 10 %
Tinners' Tools and Machines.
P. S. & W. ... list net
Traps.
Newhouse ... dis 20 %
Hotchkiss ... dis 20&10 %
Peck, Stow & Wilcox ... dis 30 %
Blake's Patent ... dis 15 @ 20 %
Trowels.
Lothrop's Brick and Plastering ... dis 10 %
Disston's Plastering ... dis 12½ %
Disston's Brick ... dis 10 %
Rose's Brick ... dis 5 %
Brades' Brick ... gold, net
Worrall's Brick and Plastering ... dis 15 %
Garden ... dis 20 %
Ventilators, Double Cone.
Keystone Portable Forge Co. ... dis 25 %
Vises.
Trenton Vises, Solid Box.
30 to 160 lbs. ... 16c
160 and over ... 19c
Peter Wright's ... ℘ ℔ 15½c. gold
Wilson's Solid Box ... dis 15 %
30 to 160 lbs ... 18c
160 and upward ... 22c
Wilson's Parallel ... dis 30 %
Backus & Union, Parallel ... dis 25 %
Buffalo, Parallel ... new list dis 20 %
Fisher & Norris' Double Screw Parallel ... dis 15 @ 15&5 %
Trenton Parallel ... dis 15 %
Parker's ... dis 20 %
Bonney's Saw Filers ... dis 20 %
Wheel Barrows.
Pugsley & Chapman—Canal ... dis 10&5 %
Coal, Garden and Stone ... dis 20 %
Wheel Heads.
Brass Bushed ... per doz $3 25 net
Well Wheels.
Revised list ... dis 55&10 %
Wire.
Bright and Annealed ... Nos. 0 @ 18 dis 35 @ 40 %
" " ... " 19 @ 26 dis 45 @ 50 %
" " ... " 27 @ 36 dis 50 @ 55 %
Coppered ... " 0 @ 18 dis 25 @ 30 %
Galvanized, Nos. 0 to 12 ... dis 40 @ 45 %
Galvanized, Nos. 13 to 18 ... dis 45 @ 50 %
Tinned ... dis 20 @ 25 %
Cast Steel ... 5 @ 10 %
Tinned Broom Wire ... dis 25 @ 30 %
Galvanized Telegraph, Nos. 8 and 9 ... ℘ ℔ 9½c @ 10½c
" " " 10 and 11 ... ℘ ℔ 10½c @ 11½c
" " " 12 ... ℘ ℔ 11c @ 12c
Annealed Fence, Nos. 8 and 9 ... dis 35 @ 40 %
" Grape, " 10 to 14 ... dis 35 @ 40 %
Fence Staples ... ℘ ℔ 8½ @ 9 %
Stubs' Steel Wire ... $7 00 to ℔ gold
Wrenches.
American Adjustable ... dis 45 %
Baxter's Adjustable "S" ... dis 20 %
" Diagonal ... dis 20 %
Collins & Co.'s ... dis 40 %
Coes' Genuine ... dis 40&5 %
" Pattern (Wrought) ... dis 50 %
" " (Malleable) ... dis 60&10 %
Lindsay's Patent ... dis 25 %
Taft's Pattern ... dis 70 %
Davis' Patent Duplex ... new list dis 25 %
Bemis & Call's Patent Combination ... dis 20&5 %
Wringers.
Universal—Extra ... ℘ doz $68 00
Novelty ... ℘ doz 68 00
Sherman ... ℘ doz 68 00
Reliance ... ℘ doz 68 00
Monitor ... ℘ doz 68 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE.

Basins.
Wash Basins, Handled, Plain Stamped ... dis 25 %
Inch ... 10 11 11½
Per doz ... $3·50 4·00 4·50
Wash Basins, Handled, Retinned ... dis 25 %
Inch ... 10 11 11½
Per doz ... $4·00 4·50 5·00
Wash Basins, with Feet, Plain Stamped ... dis 25 %
Inch ... 10 11 11½ 13½
Per doz ... $2·00 2·50 2·85 3·75
Wash Basins, with Feet, Retinned ... dis 25 %
Inch ... 10 11 11½ 13½
Per doz ... $3·00 3·50 4·00 5·00
Wash Basins, Stamped ... dis 25 %
Inch ... 10 10½ 11½
Per doz ... $1·70 2·10 2·50
Inch Shallow ... 10 11
Per doz ... $1·55 1·80
Wash Basins, Retinned ... dis 25 %
Inch ... 10 10½ 11½
Per doz ... $2·50 3·00 3·50
Inch Shallow ... 10 11
Per doz ... $2·00 2·60
Covers.
Bucket ... dis 10 %
1 pt. 1 qt. 2 3 4 6 8 10 12 qt.
Per gross ... $2·25 3·00 4·00 4·50 5·75 7·75 8·75 9·25 13·00
Coffee Pot ... dis 10 %
3 pt. 2 qt. 3 4 6 qt.
Per gross ... $1·25 1·50 1·75 2·25 3·50
Pot ... dis 10 %
Inch ... 7½ 7¾ 8¼ 8¾ 9¼ 9¾ 10½
Per gross ... $5·50 6·00 6·75 7·25 8·00 8·50 10·25
Inch ... 10½ 11¼ 11¾ 12½ 13¾
Per gross ... $11·00 11·75 12·50 15·50 19·00
Tea Kettle Breasts and Covers ... dis 10 %
Inch ... 5½ 6½ 7½ 8 8½ 9
Per gross ... $6·00 6·50 8·00 9·00 9·75 10·50
Inch ... 9½ 10 10½ 11 11½ 12½ 13½
Per gross ... $11·25 13·00 14·00 15·00 16·00 21·00 24·00
Dipper Bowls, Plain Stamped ... dis 25 %
Pints ... ½ ¾ 1 1½ Quarts ... 1 2 2½
Per doz. ·50 ·60 ·70 ·80 Per doz ... ·90 1·25 1·50
Dipper Bowls, Retinned ... dis 25 %
Pints ... ½ ¾ 1 1½ Quarts ... 1 2 2½
Per doz. ·75 ·95 1·00 1·15 Per doz ... 1·30 1·55 1·80
Pans.
Dish Pans, Tinned ... dis 25 %
Quarts ... 7 8 10 14 17 21 30
Per doz ... $8·50 9·50 11·00 13·00 16·00 19·00 30·00
Milk Pans, Plain Stamped ... dis 25 %
Quarts ... ½ 1 1½ 2 3 4 5 6 8 10
Per doz ... $·85 1·05 1·20 1·45 1·65 2·40 2·90 3·15 4·40 5·00
Milk Pans, Retinned ... dis 25 %
Quarts ... ½ 1 1½ 2 3 4 5 6 8 10
Per doz ... $1·15 1·40 1·60 1·90 2·15 3·00 3·40 3·90 5·20 6·00
Pie Plates ... dis 10 %
Inch ... 6 7 8 9 10 11
Per gross ... $4·50 5·00 7·25 7·00 10·50 12·00

JAPANNED TIN WARE.

Cannisters, Common ... dis 10 %
Pound ... ½ 1 2 3
Per doz ... $1·10 1·60 2·50 3·25
Cannisters, Hinged ... dis 10 %
Pound ... 1 2
Per doz ... $1·75 2·75 3·40 3·75 4·50
Candlesticks, Japanned ... dis 10 %
No ... 1 2
Per gross ... $8·00 7·00
Cake Boxes, Round ... per nest, $3·25, dis 10 %
" Square ... per nest, 4·25, dis 10 %
Chamber Pails, Japanned (Smith, Burns & Co.) ... dis 10 %
Nos ... 2 3 4 5
Green, per doz ... $8·00 9·00 10·50 12·50
Oak ... $9·50 10·50 12·00 13·50
Dust Pans, Corrugated ... per gross, $22·00, dis 10 %
Box Graters ... per gross, $4·00, dis 10 %
Molasses Cups ... dis 10 %
Pint ... ½ 1 2
Per doz ... $1·25 ·50 2·75
Pepper Boxes Japanned ... dis 10 %
Per gross ... Small, $3·00; Large, $4·00
Toy Banks, House ... dis 0 %
No ... 1 2
Per gross ... $7·00 5·50
Toy Banks Gothic ... dis 10 %
No ... 1
Per gross ... $5·50
Toy Cups, Straight ... dis 10 %
No ... 1 2 3
Per gross ... $4·00 3·50 3·50
Toy Cups, Flaring, nests of (3) ... per gross, $2·50, dis 10 %
Toy Pails, Covered ... dis 10 %
No ... 1
Per gross ... $4·50
Toy Rattles ... per gross, $2·25, dis 10 %
Trunks, Wire Handled ... per nest (5) $1·50, dis 10 %
Spittoons, Tin ... per gross, No. 2, $30, No. 3, $27, dis 10 %

PLANISHED TIN WARE.

Planished Coffee Pots, Round ... dis 25 @ 30 %
Each ... ·60 ·75 ·85 ·95 1·15 1·25 1·30 1·40
Pints ... 1 2 3 4 5 6 7 8
Planished Tea Pots, Round ... dis 25 @ 30 %
Each ... ·70 ·80 ·95 1·05 1·25
Pints ... 2 3 4 5 6
Planished Tea Pots, Oval ... dis 25 @ 30 %
Each ... ·70 ·80 ·90 1·05 1·15 1·40 1·75
Pints ... 1 2 3 4 5 6 8
Planished Pepper Boxes, No. 1 ... per doz., $1·52
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ℘ dozen.
Planished Round Coffee Biggins ... dis 25 %
Pints ... 2 3 4 5 6 8
Each ... $1·00 1·10 1·20 1·40 1·60 2·00
Planished Oval Coffee Biggins ... dis 25 %
Pints ... 2 3 4 5 6 8
Each ... $1·15 1·25 1·40 1·60 1·80 2·25
Planished Oval Chafing Dishes, Imperial Covers ... dis 25 %
Inch ... 10 12 14 16 18 20 22 24
Each ... $3·85 5·00 6·25 7·60 9·00 11·50 15·00 16·50
Planished Oval Chafing Dishes, Low Covers ... dis 25 %
Inch ... 10 12 14 16 18 20
Each ... $3·25 4·35 5·20 6·20 7·80 9·25
Planished Low Dish Covers ... dis 25 %
Inch ... 10 11 12 14 16 18 20
Each ... $·70 ·80 1·00 1·25 1·50 2·00 2·75
Planished Imperial Dish Covers ... dis 25 %
Inch ... 10 11 12 14 16 18 20 22 24
Each ... $1·55 1·70 2·00 2·60 3·15 3·45 4·60 5·45 6·30
Planished Etnas, on Stands ... dis 25 %
Pints ... 1½ 2 3 4 5
Each ... $0·90 1·00 1·20 1·50 1·75
Planished Liquor Mixers ... dis 25 %
Nos ... 0 1 2
Per doz ... $2·00 2·10 2·45
Planished Oval Melon Molds ... dis 25 %
Nos ... 2 3 4 5 6 7 8 9
Each ... $·60 ·65 ·70 ·80 ·90 1·00 1·15 1·35
Planished Oval Tumbler Warmers ... dis 25 %
To fit 1, 2, 5, and 4 O. G. Urns ... each, $2·50
Planished Oval O. G. Urns ... dis 25 %
Nos ... 0 1 2 3 4 5 6 7 8
Each ... $4·90 5·45 6·30 7·00 7·75 9·25 11·25 12·50 15·50
Planished Round Urns ... dis 25 %
Nos ... 0 1 2 3 4 5 6 7
Each ... $4·20 4·85 5·45 6·30 7·75 9·00 11·00 14·25
Planished Round Oyster Dishes, (Complete) ... dis 25 %
Nos ... 1 2
Each ... $2·10 2·60
Planished Oyster Dish Plates ... dis 25 %
Nos ... 1 2
Each ... $0·25 0·30
Oyster Dish Covers ... dis 25 %
Nos ... 1 2
Each ... $0·30 0·35
Tea Pot Handles—P. S. & W. ... dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small 4½ inches ... per gross, $11·50
No. 2, Medium, 5¾ " ... " 12·50
No. 3, Large, 6¾ " ... " 13·50
No. 4, Ex. Large, 7¾ in., for Wash Pitchers, &c. ... " 18·00

Stow's Patent. New Pattern.

No. 25, Small,	4½ inches	per gross, $11·50
No. 35, Medium,	5⅜ "	" 12·00
No. 45, Large,	6⅛ "	" 13·00

Solid Iron, Tin Tipped.

No. 10, Small,	4⅜ inches	per gross, $9·00
No. 15, Medium,	5⅛ "	" 9·50
No. 20, Large,	6⅝ "	" 10·75

Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W.

No. 12, Bronzed and Tin-Tipped.....per gross, $13·50

Saucepan Handles. Of Best Malleable Iron.

P. S. & W.....dis 20 %

Japanned.

No. 1, 5¼ inches long		per gross, $3·50
No. 2, 6	"	" 3·75
No. 3, 6½	"	" 4·00
No. 4, 7¼	"	" 4·25
No. 5, 8	"	" 4 50
No. 6, 9	"	" 4·75

Tinned.

No. 1, 5¼ inches long		per gross, $4·25
No. 2, 6	"	" 4·50
No. 3, 6½	"	" 4·75
No. 4, 7¼	"	" 5·25
No. 5, 8	"	" 5·50
No. 6, 9	"	" 5·75

Japanned.....per lb., ·16

Tinned..... " ·20

Iron Kettle Ears (P., S. & W.).....dis 45 %

Half gross pairs in a package.

METALS.

IRON.—DUTY: Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.

Foundry No. 1	₩ ton,	$32 50 @ 35 00
Foundry No. 2	"	30 00 @ 33 00
Gray Forge	"	27 00 @ 30 00
White and Mottled	"	

SCOTCH.

Coltness	"	@ 40 00
Glengarnock	"	37 00 @
Eglinton	"	34 00 @ 35 00

Bar Iron.

Am. Rehned, at mill.....₩ ℔ 2·8c @ 3c

Rails.

Welsh, gold	₩ ton,	52 00 @ 54 00
American, at works, currency	"	60 00 @ 62 50
Old Rails, T, currency	"	36 00 @ 38 00

Scrap.

Wrought Scrap, from yard..... " 40 00

Bar Iron from Store.

Common Iron.		
⅜ to 2 in. round and square	₩ ton,	$ 67 50
⅝x9-16 in " "	"	72 50
½ in. " "	"	75 00
2¼ to 3 in. " "	"	72 50
1 to 6 in. wide x ⅜ and 1 in. thick	"	67 50
1¼ to 6 in wide x ⅜ & 5-16 in. thick	"	72 50
1 and 1¼ in. x ¼ and 5-16	"	75 00
Swedish Iron		
1¼ x ⅜ and ½	"	165 00
1⅛x⅜ to ⅝, and ¾ square	"	160 00
1¾ to 5x⅜ to ¾ and ⅞ to 2-in. square	"	155 00
6 to 8x⅜ and ½	"	165 00
Refined Iron.		
⅜ to 2 in. round and square	"	70 00
1 to 6 in. wide x ⅜ to 1 thick	"	70 00
1¼ to 6 in wide x ⅜ and 5-16 thick	"	75 00
1 and 1¼ x ¼ and 5-16	"	75 00
Large Rounds.		
2⅜ to 2¾, round and square	"	77 50
3, 3¼ and 3½ in.	"	82 50
3¾ and 4 in.	"	92 50
Rods—⅜ and 11-16, round and square	"	75 00
½ and 9-16, " "	"	77 50
7-16, " "	"	82 50
⅝, " "	"	87 50
5-16, " "	"	92 50
¼, " "	"	97 50
3-16, " "	"	125 00
Band Iron.		
1 to 6 in. x 3-16 to No. 12	"	87 50
Horse Shoe Iron.		
⅜ and ½ x ⅜, to ½	"	105 00
1 x ⅜, to ⅝	"	
Ovals, Half Ovals and Half Rounds.		
⅜ to 1½	₩ ton,	$ 85 00
⅝ and 11-16	"	100 00
½ and 9-16	"	105 00
7-16	"	
⅜	"	
Nail Rods		
Best Norway	₩ ℔	8¼ @ 9c
Norway Shapes		
½ to 2 in. x ⅛ to ⅝	₩ lb	8¼c
¼ to ⅜ square	"	
Norway Bar		
⅜ to 2 in. square		
Spring Steel		
1 to in. wide	"	8c
Tire Steel		
⅜ to 1¼ x ⅛ and 5-16	"	7½c
⅜ & 1 x 3-16	"	7½c
⅜ & 1 x ½	"	8½c
Toe Calk Steel		
⅜ to ½ x ⅜ to ½	"	7½c
Plow Steel		
6 to 16 wide	"	8½c
Sleigh Shoe Steel		
⅜ to 1½ x ⅜ to ⅝		6½c
Hoops, ⅜ x No. 22	₩ ton	$155 00
" ⅜ x No. 20	"	125 00
" ⅜ x No. 19	"	120 00
" 1 and 1¼ x No. 18	"	110 00
" 1¼ to 2 and 1x1½ x No. 13 and 14	"	100 00
Scroll Iron—⅜ x 12	"	130 00
" ⅜ x 10	"	125 00
" ⅜ x 3-16	"	120 00
" ½ x ¼	"	115 00
" ⅜ x 14	"	120 00
" ⅜ x 13	"	115 00
" ⅜ x 10	"	110 00
" ⅜ x 5-16	"	105 00
" ⅜ x ¼	"	100 00
" ½ x ¼	"	110 00
" ⅜ x 12	"	110 00
" ⅜ x 10	"	105 00
" ⅜ x 3-16	"	100 00
" ⅜ x ¼	"	97 50
" ½ x 14	"	110 00
" ⅜ x 12	"	100 00
" ⅜ x 10	"	95 00
" ⅜ x 3-16	"	92 50
" ½ x ¼	"	90 00
" ⅜ x 14	"	115 00

Sheet Iron.

	Common English.	R. G. American.	R. G. English.
Nos. 10 to 20 ₩ ℔	4½ @ 4¾c	5¾c	6c
21 to 24 "	5 @ 5¼c	6c	6¼c
25 to 26 "	5½c	6¼c	6¾c
27 "	5¾c	6¾c	7c
28 "	6c	7c	7¼c
30 "	7¼c		

Galvanized, 10 to 20, prime	₩ ℔	10c
" 21 to 24	"	11c
" 25 to 26	"	12c
" 27	"	13c
Patent Polished	"	15 @ 16c
Russia, Nos. 8 to 11	₩ ℔	19c
" Nos. 12 to 16	"	19c
" Stained, No. 1	"	17½c
Belgian	"	12c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON

4½	5	5½	6	7 inch.
$2·50	3·50	4·50	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$5·00	7·00	9·50	12·00	14·00 per doz.

Brass.

ROLLED AND IN SHEETS.

(Brown & Sharp's Gauge.*)

For the purchase of 100 pounds and over at one time

HIGH BRASS.

All Nos. to No. 28, and widths 14 in. and under	34c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in. inclusive	37c
Over 20 in. to 30 in. inclusive	40c
½c ₩ ℔ advance on each No. above No. 28 to 38, inclusive.	
All Brass thinner than No. 38 is Platers' Brass at	53c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths	40c
Printers' Rules	44c
Sheets wider than 30 in. and under 40 in.	44c
" 40 in. and over	46c
Circular sheets, in diam. from 4 in. to 14 inclusive	44c
" " " over 14 in. to 20 "	47c
" " " 20 in. to 30 "	50c
" " " 30 in. to 40 "	53c
" " " 40 in.	56c
Brass Rods above No. 0, and under 1 in.	43c
" " 1 in. and over	47c

LOW BRASS.

6c ₩ ℔ more than High Brass.

Gilding Metals, 7c ₩ ℔ more than High Brass.

Platers' or Gold Metal	In Bars	46c
	Sawed	49c

FOR SLITTING: Metal in Width.

in. to ⅛ in., to No. 30, inclusive, 1c ₩ ℔ advance.
in. to 1 in., thinner than No. 30, 2c ₩ ℔ advance.
2 in. to ¼ in.. " " 30, 3c " "
⅛ in. and less to No. 30, 2c ₩ ℔ advance.
⅛ in. and less thinner than No. 30, 5c ₩ ℔ advance.
10 % discount.

SCRAP—NEW METAL.

High Brass Scrap, 17 cents, net.
Low " 19 " "
Gilding, 21 cents, net.
Turnings, Filings and Chips, half the price of Scrap, net

BRASS AND COPPER WIRE.

(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20	37	41	47
Nos. 21, 22, 23	38	42	48
Nos. 24 and 25	39	43	49

Brass Wire straightened and cut, 4 cents advance
10 % discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 26	0·41	0·45	0·51
No. 27	0·44	0·48	0·54
No. 28	0·46	0·50	0·56
No. 29	0·48	0·52	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·73	1·03
No. 36	0·78	0·82	1·15
No. 37	0·94	0·98	1·28
No. 38	1·28	1·28	1·58

Ten cents per pound extra for Spooling.

TUBING.

(Brown & Sharpe's Gauge.)

	₩ ℔
Plain to No. 20, inclusive	50·52
Nos. 21, 22, 23, 2c. advance on List for each No.	
Nos. 24, 25, 26, 4c. " "	
Above No. 26 special rates.	
Plain Tube, 1-4 inch	68
" 3-16 "	1 58
" 1-8 "	1 78

All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20 61
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet. 10 % discount.
BRASS DOOR RAIL—48 cents per lb.—10 % dis.

BELT AND HOSE COPPER RIVETS AND BURS.

Price per ℔	49	50	52	54	56	58	60	64	68c
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 43 cents per pound discount 25 %.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent. 12 inch. to No. 26	·75	·90
6 " " "	·85	1·00
10 " " "	1·05	1·25
15 " " "	1·30	1·55
18 " " "	1·45	1·75
20 " " "	1·55	

Discount 10 %.

German Silver Sheets over 12 inches wide and weighing more than 10 lbs. ₩ ℔ net
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Filings and Chips, half the price of Scrap.
* Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Gauge.

COPPER—DUTY: Pig, Bar and Ingot, 5c.; old copper, 4 cents ₩ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.

American Ingot	₩ ℔	26 @ 26½c
English	"	

SHEATHING, BRAZIERS COPPER, BOLTS, &C.

Braziers Copper, ordinary sizes, over 16 oz., per square foot		35c ₩ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot		38c. "
Braziers Copper, 12 oz. per square foot and lighter		41c. "
Circles less than 24 inch in diameter		38c. ₩ ℔
Circles, 24 inch diameter and over		41c. "
Segment and Pattern Sheets		38c. "
Locomotive Fire Box Sheets		35c. "
Sheathing Copper, over 12 oz. per sq. ft		39c. "
" 12 oz. ₩ sq. ft. and lighter		41c. "
Bolt Copper		35c. "

No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

TINNING.

14x48, by the case	8c. ₩ sheet
14x48, less than case	10c. "
Boiler Sizes, 7 and 8 inch	12c. "
" 9 inch	15c. "
Other sizes not larger than 30x60	2½c. ₩ sq.
Larger than 30x60	5c. "
Copper Bottoms, 34 @ 36c.	₩ ℔ net

O'NEILL'S PATENT PLANISHED COPPER.

14x48.

14 and 16 oz. and heavier	39c.	By the case, 38c. ₩ ℔
12 oz. and lighter	42c.	" " 41c. "

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60

14 and 16 oz. and heavier.....41c. By the case, 40c. ₩ ℔
(And all sizes not over 20 inches wide.)
80x60

14 and 16 oz. and heavier	43c. ₩ ℔
12 oz	46c. "

LEAD—DUTY: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.: Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.

Spanish	6½ @ 6¾c gold
German Refined	6½ @ 6¾c gold
English	6½ @ 7c gold
American	6¾ @ 6¾c gold
Bar	dis 10 % ¼c.
Pipe	dis 10 % 9c.
Tin Lined Pipe	dis 10 % 16½c.
Sheet	dis 10 % 9c.
Shot	dis 10 % Drop, 9c.: Buck, 9½c.
Solder	No. 1, 16 @ 17c; No. 2, 15c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 3¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3¼ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	16c
Spring	12½c
Homogeneous	13½c
Tire	12¾ @ 13½c
Machinery (round and square)	11½ @ 12c
File	12½c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₩ ℔	20 @ 21c
Tool, extra fine	"	40 @ 75c
Spring	₩ ℔	12c and upward
Machinery	₩ ℔	14c.
Hammer	"	15c.
Gun or Homogeneous	"	16c

English Steel.—payable in gold, dis 5 % cash.

Best Cast	₩ ℔	18c
Extra Cast	"	19c
Round Machinery, Cast	"	11½c
Swaged, Cast	"	18c
Best Double Shear	"	18c
Blister, 1st quality	"	13½c
" 2d quality	"	11½c
" 3d quality	"	10½c
German Steel, Best	"	11½c
do 2d quality	"	10½c
Sheet Cast Steel, 1st quality	"	18c
" " 2d quality	"	16c
" " 3d quality	"	14c
File Steel, Flat and ½ Round	"	12½c
" Square and Round	"	13c
" Mill	"	13½c
" Taper to 4 inch	"	17c
" Taper 3 and 3¼ inch	"	18c

SPELTER—DUTY: in Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	6¾ @ 7c., gold	
American	7¾ @ 11c., currency	

TIN—DUTY: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val.—all subject to a reduction of 10 per cent. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.

Banca	₩ ℔	27c., gold
Straits	₩ ℔	26c., gold
English	₩ ℔	23 @ 24c., gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal	12·00 @ 12·25
12x12, "	12·75
14x20, "	13·00
I X 10x14, "	14·50
12x12, "	15·00
14x20, "	15·50
D C 12¼x17 "	11·75
D X 12¼x17 "	14·00
For each additional X add	2·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$11·25 @ 11·50	10·25 @ 10·50	9·25 @ 9·75
I C 12x12	11·75	11·00	
I C 14x20	12·00	11·00	

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$11·00 @ 11·25	10·00 @ 10·75	8·00 @ 10·00
I X 14x20	13·75		
I C 20x28	23·00	21·50 @ 22·00	19·00 @ 21·00
I X 20x28	28·50	27·50	
I C 20x20 ℔	28·00		

ZINC.—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2½c. ₩ ℔. All subject to a reduction of 10 per cent.

Sheet	cask 9½c
"	open 10c

Paper Stock, Old Metals, &c.

(*Dealers' Selling Prices.*)

Canvas linen		6¼ @
" cotton. No. 1		@ 7
" " No. 2		@ 4
White linen rags, No. 1		@ 7¼
" " No. 2		@ 5
Colored		2½ @
Mixed woolens		@ 3
Soft woolens		@ 6½
Gunny bagging		1¾ @ 2
Jute Butts		2¼ @ 2¾
Kentucky bagging		5¼ @ 5½
Book stock		4 @ 4½
Waste paper and scraps		1½ @ 3
Rope cuttings		1½ @ 3
Kentucky Bale rope		4 @ 4¼
Oakum junk, No. 1		5½ @ 5¾
" No. 2		4 @ 4¼
Grass rope		4 @ ..
Tarred Shaking		1½ @ 2
White Collar Cuttings, all paper		7 @ ..
" " " muslin lined		5 @ ..
" Envelope "		7 @ ..
Hard White Shavings, No. 1		6¼ @ ..
Soft " " No. 1		6 @ ..
White Shavings, No. 2		5¾ @ 6
Mixed Shavings, part white		4 @ 4¼
Imperfections, No. 2, best folded sheets		5 @ ..
" " No. 1, Heavy Stock		4¾ @ 5
Book Stock, Mixed		3¾ @ 4
" " No. 2, light		2¾ @ 3
Prints		1¾ @ 2
Pure Manilas		2¾ @ 2¾
Bogus Manilas and Hardwares		1¾ @ 1¾
Commons		1 @ ..
Binders' Board Cuttings		1¾ @ ..
Straw Board Cuttings		1¾ @ 1¾

Old Metal.

Copper	23	@ 24
Yellow metal	16	
Brass	16	
Heavy Composition	19	@ 20
Old lead, solid		5¼
Tea lead		5¾
Wrought iron	1½ @	1¾
Sheet iron	0¾ @	
Cast iron	1 @	1¼
Machinery iron	1¼ @	1½
Zinc		5½
Pewter, No. 1	24	@ 28
" No. 2	10	@ 12
Spelter		7

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₩ ℔	20c
" " Ordinary		6c
" Ivory Drop, fair		15c
" " best		36c
Black Paint, in oil	kegs, 8c.; asst'd cans, 11	c
Blue, Prussian, fair to best		50 @ 75c
" " in oil		35 @ 65c
" Chinese, dry		85c
" Ultamarine		25 @ 30c
Brown, Spanish		1¼c
" Van Dyke		9c
Carmine, 40		$12 00
Green, Chrome		15 @ 23c
" in oil		18 @ 25c
" Paris	good, 30c; best, 40c	
" " in oil	30c;	45c
Mineral Paints		1¾ @ 4c
Orange Mineral		14½c
Red Lead, American		9¼c
" " English		10½c
" Venetian (N. C.) dry		2¾c
" " in oil	asst'd cans, 11c; kegs, 8	¼c
" Indian, dry		10c
Rose Pink		18c
Sienna, American, Raw		4c
" Burnt		4½c
" " in oil		16 @ 20c
" Raw "		15 @ 25c
Umber, Burnt		4 @ 8c
" " in oil		16 @ 21c
" Raw		3½ @ 7½c
" " in oil		16 @ 22c
Vermillion, Chinese		$1 92
" English		1 87
" Trieste		1 65
" American, Common		25c
White Lead, American, pure dry		10½c
" " " in oil		11½c
White, Paris, English, prime	in bbls.	2½ @ 2¾c
Yellow Ochre French		2½ @ 2¾c
" in oil	asst'd cans, 11c; kegs, 8	¼c
" Vermont	in casks	1½c
" Chrome		17 @ 21c
" in oil		18 @ 22c
Zinc White, American No. 1 dry		9c
" 1, in oil		11c
" French (Paris)		11 c
" " in oil		12

Oils.

Linseed Raw	₩ gal. casks, 97c.	bbls. 98c.
" Boiled	" $1·03	" $1·03
Whale, Crude		
" Bleached Winter		
Sperm, Crude		" 1·50
" Winter unbleached		" 1.70
" Bleached		" 1·75
Seal, Extra Refined		
Lard, Pure Winter		" 92c
" Spring		
Cotton Seed, Crude		" 42½c
" Southern Yellow	46½c @	47½c
" White		
Neatsfoot, Winter	70c @	$1·10
Natural Lubricating	38c @	40c

Sundries.

Asphaltum		9c
Benzine	₩ gal.	16c
Chalk		1¼c
" Block		
Dry or, Patent, Am'n	ass't cans, 10½c.; kegs	9c
" English	" 11c.;	9c
Flocks		50c
Frostings		33 @ 47c
Glue, White		20c
" Sheet		9c
Glaziers' Points, Zinc		86c
Gum, Copal		25c
" Damar		60c
" Shellac, English		5c
" " dark		10c
Litharge		6 @ 6c
Pumice Stone, selected Lumps		4c
" powdered		3½c
Putty in bladders		3c
" in bulk		8c
Rotton Stone, soft, English		43c
Spirits Turpentine		1c
Whiting, Spanish		

Glass.

French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	
6 x 8 to 10 x 15	$10·25	$9·25	$8·75	$9·00
11 x 14 to 16 x 24	12·00	11·00	10·00	9·50
18 x 22 to 20 x 30	15·00	13·50	12·00	10·50
15 x 36 to 24 x 30	17·50	15·25	12·50	
26 x 28 to 24 x 36	18·25	16·00	13·25	
26 x 36 to 26 x 44	20·00	18·00	14·50	
26 x 46 to 30 x 50	21·00	19·00	15·25	
30 x 52 to 30 x 54	22·50	20·25	16·25	
30 x 56 to 34 x 56	24·50	21·75	19·00	
34 x 58 to 34 x 60	26·00	24·50	21·50	
36 x 60 to 40 x 60	30·50	27·00	24·50	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$16·50	$15·00	$14·00	$13·00
11 x 14 to 16 x 24	19·25	17·75	16·00	15·25
18 x 22 to 20 x 30	24·00	21·75	19·25	
15 x 36 to 24 x 30	28·00	24·50	20·00	
26 x 28 to 24 x 36	29·25	25·75	21·25	
26 x 36 to 26 x 44	32·00	29·00	23·25	
26 x 46 to 30 x 50	33·75	30·50	24·50	
30 x 52 to 30 x 54	36·00	32·50	26·00	
30 x 56 to 34 x 56	39·25	35·00	30·50	
34 x 58 to 34 x 60	41·75	39·25	34·75	
36 x 60 to 40 x 60	49·00	43·25	39·25	

Sizes above—$12·00 per box extra for every 5 inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.
Discounts 50 %, 10 % and 5 % to 60 %.

A. C. Downing & Comp'y,

Wm. C. Stuart. Francis Dougherty.

Importers of and Dealers in

Window Glass,

FRENCH PICTURE

And Car Glass, etc.

Estimates given by mail.

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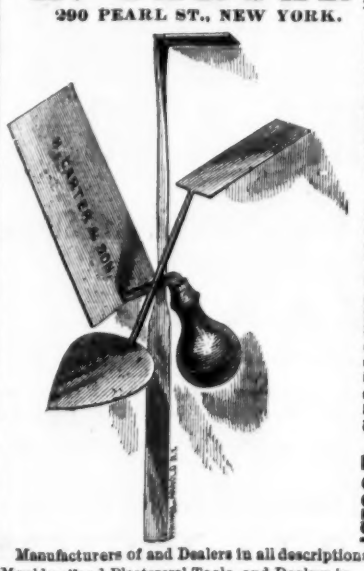
NEW YORK.

H. CARTER,

290 PEARL ST., NEW YORK.



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Manufacturers of and Dealers in all descriptions of Moulders' and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes, CARTERS' PATENT CARRIAGE LIFTING JACK, &c.

Hardware.

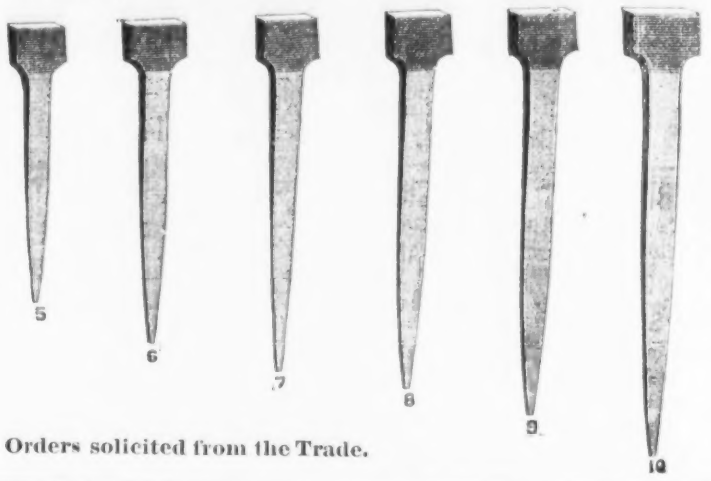
PRATT & CO.,

Hardware & Iron Merchants, Buffalo, N. Y.

Manufacturers of the Superior Brand,

BUFFALO FORGED HORSE NAILS.

These Nails are superior, being made with new and improved machinery and actually hammered from the best brands of Norway Iron.



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GEORGE B. WALBRIDGE

99 Chambers Street, New York,

Self-Feeding Blacksmiths' Drills.

Good, Serviceable and Durable.

CHALLENGE AUGERS AND BITS,

Union Door Bolts,

Spoke Shaves, &c.

Patent Reservoir Vases and Hanging Baskets.

These Vases are constructed with a reservoir base to contain water, which is drawn up into the vase by capillary attraction, keeping the earth sufficiently moist for ten to twelve days without attention. The advantage of this feature for CEMETERY USE will be readily seen. Send for circular giving styles and sizes.

The HANGING BASKETS are made on same principle, the reservoir bottom being spun of zinc, handsomely japanned and decorated in various colors. There is no danger of their drying up; no necessity for taking them down to be watered; no dripping after watering. Manufactured by

CHARLES E. WALBRIDGE,

297, 299 & 301 Washington St., BUFFALO, N. Y.

AGENTS. FERNALD & SISE, 100 Chambers Street, N. Y.
KELLOGG & KING, Detroit, Mich.
HOVEY & CO., Chicago, Ill.

The Improved Champion Ice Cream Freezer of 1874,

Is in all respects THE BEST IN THE MARKET.

Patented, July 9, 1872.

TWELVE SIZES.

Geared.

No.	Quart.
20	3
21	4
22	6
23	8
24	10
25	12
26	16
27	20

Fly Wheel.

No.	Quart.
28	10
29	30
30	40

Gang Freezers.

No. 31, two 20 quart together.

Please send for Circulars and Price Lists.

Sole Manufacturers, SIDNEY SHEPARD & CO., Buffalo, N. Y.

GEO. B. WALBRIDGE, Agent, 99 Chambers St., N. Y.

Grindstones, Emery, &c.

Walter R. Wood,

GRINDSTONES

283 FRONT STREET,

NEW YORK.

EMERY WHEELS AND MACHINERY

Upon which to run the same, of all kinds.

EMERY Emery Cloth, Mill Stone CEMENT. TRADE MARK. DIAMOND Tools, Oil Stones,

Soapstone Register Borders.

For particulars, address,

UNION STONE CO.,

6 Exchange and 26 Devonshire Streets, Boston, Mass.

THE TANITE COMPANY

Emery Wheels TANITE Emery Grinders

STROUDSBURG UTILITAS MONROE Co. Pa.

GRINDSTONES

2000 TONS ON HAND. FOUNDED 1810.

J. E. MITCHELL. PHILA.

WILLIAMS WHITE & CHURCHILL,

Successors to

MACKRELL & RICHARDSON MFG. COMPANY,

Manufacturers of

Builders' Hardware,

Locks, Hinges, Hooks and Staples,
Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS, &c.

Factory, cor. Flushing and Nostrand Avenues BROOKLYN.

Warehouse, 73 Warren St., N. Y.

ZERO Refrigerator,

WITH

Water, Wine & Milk Cooler

is the BEST

MEAT, FRUIT & ICE PRESERVER

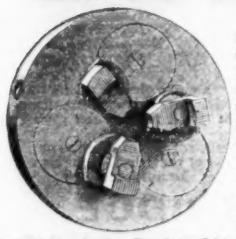
in the World.

Highest Award, American Institute 1867, 1869, 1871. New York, New England, New Hampshire, N. Carolina, Texas, Louisiana, Illinois, State Fairs. Refer to **Hart, Bliven & Mead Mfg. Co, Russell & Erwin Mfg Co.** Send for Catalogue.

ALEX. M. LESLEY, Manufacturer,
224 & 226 W. 23d St., New York City.

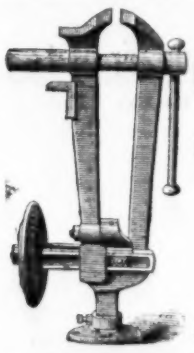
JOHNSON'S PATENT UNIVERSAL

LATHE CHUCK.



We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List, address,

Lambertville Iron Works, Lambertville, N. J



Patent Parallel

Machinist's Vise

Manufactured by

Harrisburg Foundry and Machine Company,

Harrisburg, Pa.

☞ *Send for Circular and Price List.*

RIEHLE BROTHERS,

Ninth Street, near Coates, Philadelphia.
New York Store, 93 Liberty Street,
Pittsburgh Store, 58 Wood Street,

"Patented Furnace Charging Scale."

Double Beam R. R. Track Scale, Compound Parallel Crane Beams, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.

Bemis & Call Hardware & Tool Co.'s

This Wrench can be furnished with Brigg's Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout. And not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench. Thus making a Combination which has no equal.

For Circulars and Price List, Address,

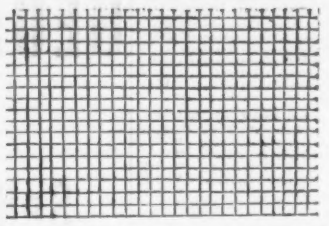
BEMIS & CALL HARDWARE & TOOL CO. Springfield Mass.

Nos. 139, 141, 143 **MARKT & CO.,** Centre Street,

MANUFACTURERS AND NEW YORK. IMPORTERS OF

HARDWARE SPECIALTIES.

DOOR KNOBS (Lava, Porcelain and Mineral.)
Shutter, Picture and Drawer Knobs.
Plate and Drop Escutcheons.
Picture Nails and Curtain Pins.
Bright Wire Goods.



Wire Cloth for Screens.
Furniture Nails.
Bright Halter and Coil Chains.
French Wire Nails.
Wrought Iron & Brass Butts.

To buyers of Wire Cloth we give the assurance that our imported Screen Cloth is of best quality and finish—it excels in beauty and durability of color. We keep plain, green, gray, black, fancy patterns and landscape in stock, and all orders for ordinary widths from 24 to 48 inches will be promptly executed. Prices guaranteed satisfactory.

L. COES & CO.,

Manufacturers of

L. COES' Genuine Improved *PATENT* **SCREW**

WRENCHES,

Worcester, Mass.

Our Mr. L. Coes, formerly senior member of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar *wider*, where the strain comes most severe, and screwing a nut up firmly against four *square* shoulders inside the ferrule, thereby *effectually* preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the market.

There are *Imitations* of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 16th, 1863 (re-issued June 1st, 1869), June 26th 1866, March 23d, 1869 (re-issued April 12th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped

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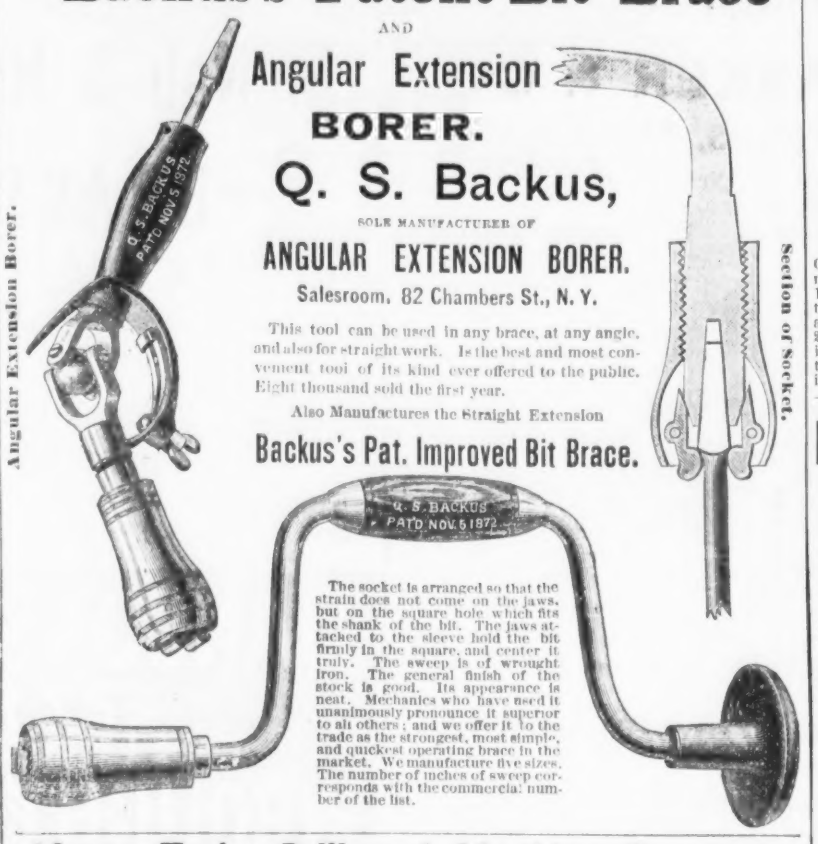

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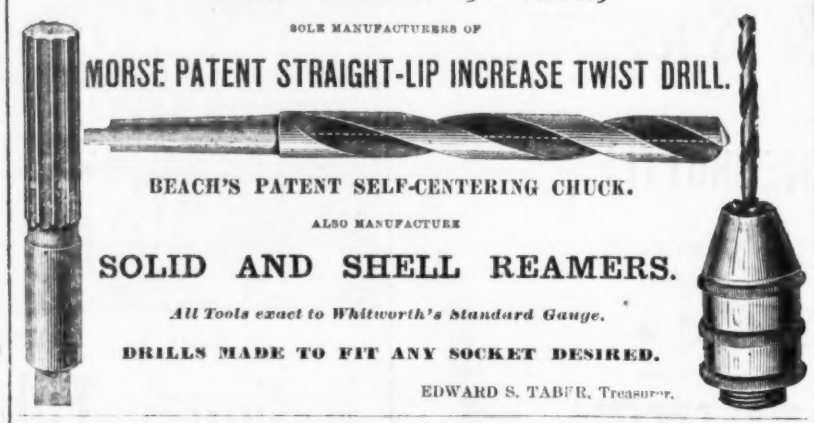

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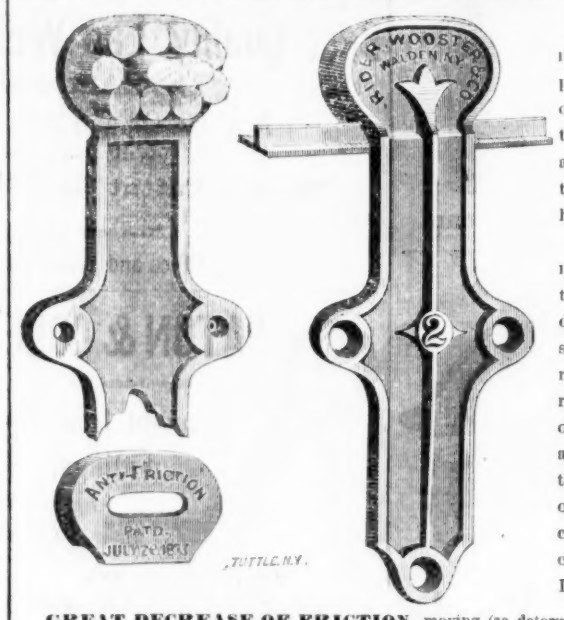

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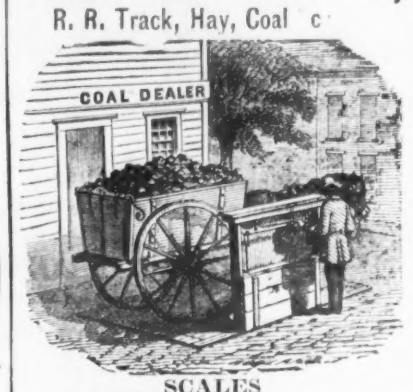

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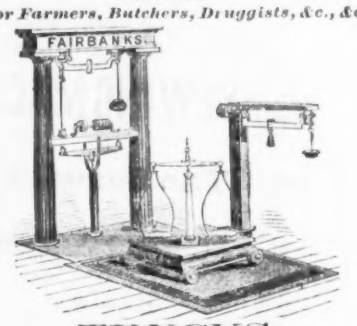

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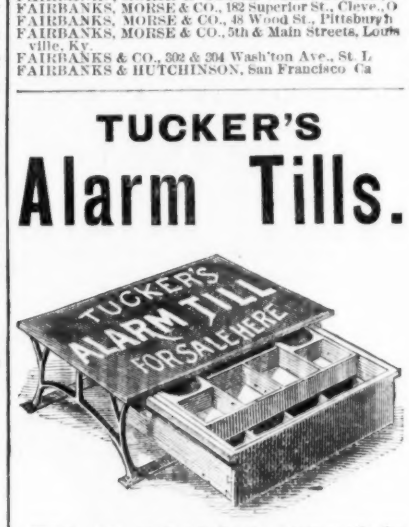

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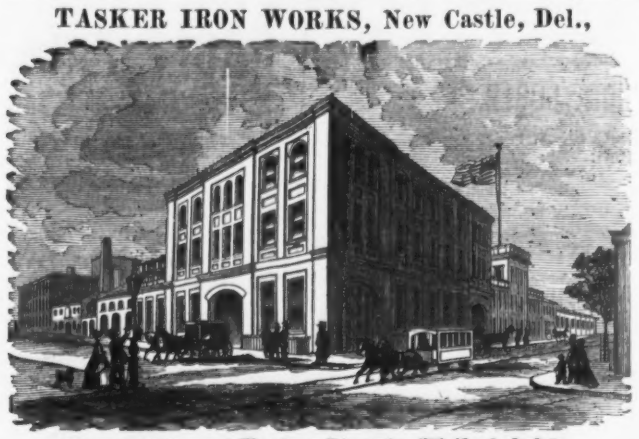

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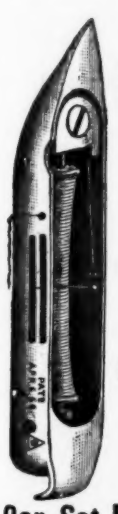

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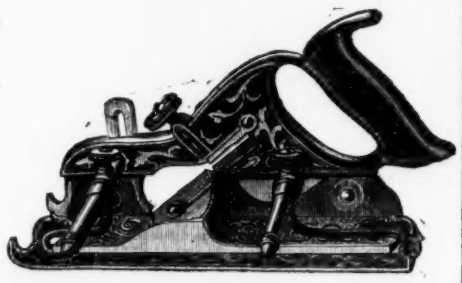

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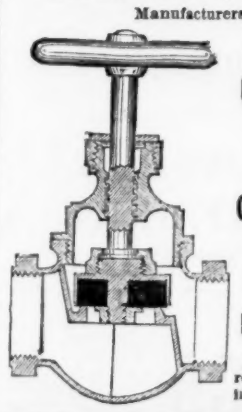

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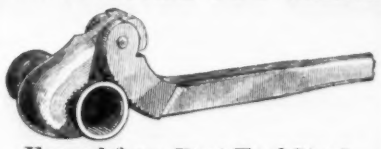

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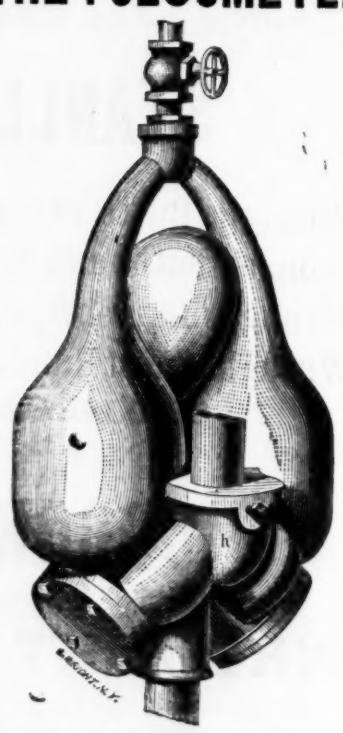

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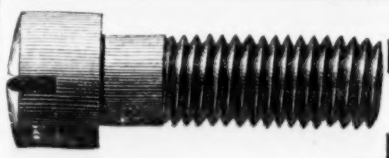

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IRON, STEEL and BRASS.

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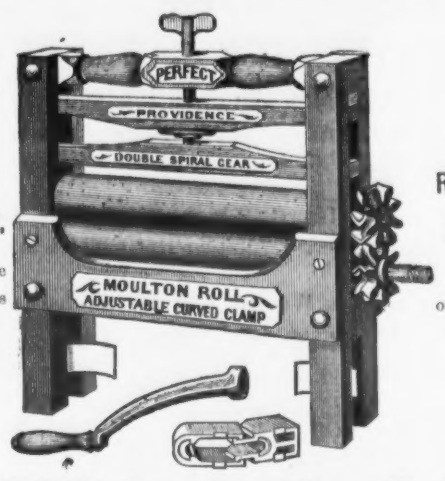
Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

PROVIDENCE TOOL CO..

The Providence Wringer.



Metal Journal Casings.

NO WEAR OUT

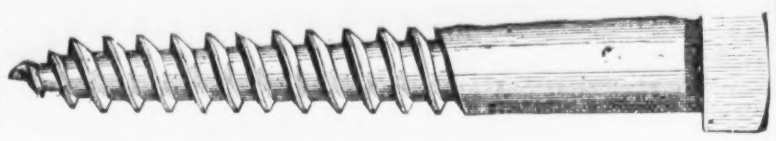
HINGE CLAMP.

Covers more surface on all kinds of articles than any in market.

ALL WHITE Rolls, Double Cogs, V Shape.

Cannot be thrown out of gear on either end.

H. B. NEWHALL, Agent, No. 11 Warren St., N. Y.



WM. H. HASKELL & CO.,

Pawtucket, R. I.,

Manufacturers of

Coach Screws (with Gimlet Point),

all kinds of

Machine and Plow Bolts,

FORGED SET SCREWS AND TAP BOLTS.

Warerooms, No. 11 Warren St., New York, H. B. NEWHALL, Agent.

Address your Orders to H. B. NEWHALL, Agent, No. 11 Warren Street, N. Y.

BURDETT, SMITH & CO.'S

Cheap Cooking Stove for Coal and Wood.

STAR OF EMPIRE.

Manufacturers of the Great Soft Coal Burner

DUBUQUE.

SEE THEIR LINE BEFORE BUYING.

WOMAN'S RIGHTS, NEW GOLDEN WEST, PASSPORT.

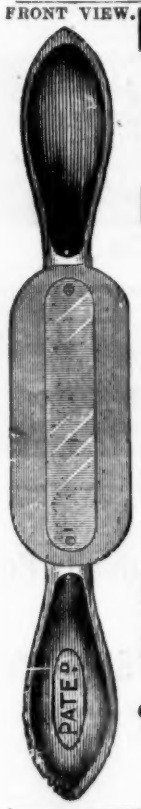
We claim to have the BEST AND CHEAPEST line of goods in the market. Dealers would do well to send for price list circular to

BURDETT, SMITH & CO., 253 River St., Troy, N. Y. / 538 S. Clark St., Chicago, Ill.

T. A. WESCOTT, 83 & 85 Blackstone St., Boston, Mass.

FRONT VIEW. BACK VIEW

LLOYD, SUPPLEE & WALTON,



WHOLESALE

HARDWARE HOUSE,

AND

HARDWARE FACTORS.

BATES' MANUFACTURING CO.'S GOODS.

Bonney's Pat. Hollow Augers & Spoke Trimmers.

Bonney's Patent Double-Edged Spoke Shave.

Bonney's Patent Adjustable Gate Hinge.

Bonney's Patent Sash-Fast and Lamp Bracket.

625 Market Street,

PHILADELPHIA.

The Finest Machinery Oils,

Combined from Sperm, Tallow and Lard Oils, and suitable for *all* machinery, are now being furnished to consumers at from 40 to 75 cents per gallon, by **WM. F. NYE, New Bedford, Mass.**

His famous **SPERM SEWING MACHINE OIL** received the highest award at the Vienna Exposition.

C. W. PACKER'S

PATENT

ICE CREAM FREEZERS.

These Freezers have been in use since 1860, with the most flattering results, and they have well earned the reputation of being the **BEST ICE CREAM FREEZER** ever introduced. A large number of Testimonials might be offered in recommendation, but the fact that they are now sold by the leading houses in all the principal cities in this country, and also numbers of them are exported every year, is a sufficient guarantee of their excellence. They are made in the most durable and substantial manner, none but the best materials are used in their construction, and the mechanical arrangements are such that they will freeze Cream, Fruits, or Water Ices, in the shortest possible time.

DOUBLE ACTION FREEZER.

SIZES AND PRICES.

10 quarts	$15 00		
15 "	$20 00—With Fly Wheel	25 00	
25 "	25 00— " "	30 00	
35 "	with Fly Wheel	40 00	

COG WHEEL FREEZER.

SIZES AND PRICES.

2 quarts	$3 50	8 quarts	$ 9 00
3 "	4 50	10 "	12 00
4 "	5 50	15 "	15 00
6 "	7 00		

For sale in New York at minimum rates by Wholesale Dealers in House Furnishing Goods generally.

CHARLES W. PACKER, Manufacturer, Philadelphia.

Having great facilities for doing cheap work as well as costly, using Waymoth's variety turning lathe, which in many kinds of work will lessen the cost at least one-half, we are prepared to furnish patentees and dealers with finished work in quantity.

THE READING BOLT & NUT WORKS.

J. H. STERNBERGH

READING PA.,

Manufacturer of all kinds of

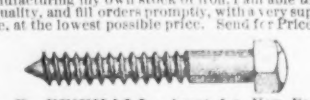
Machine Bolts, Bolt Ends,

RODS for Bridges & Buildings,

HOT PRESSED NUTS,

Washers, Coach Screws, Refined Iron, &c.

Manufacturing my own stock of iron, I am able to control quality, and fill orders promptly, with a very superior article, at the lowest possible price. Send for Price List.



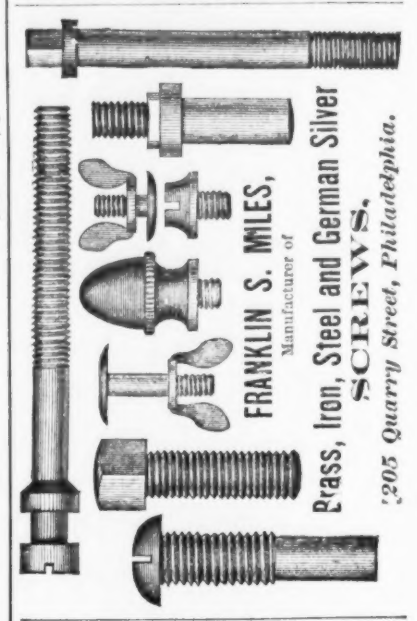
H. B. NEWHALL, Agent for New England States, New Jersey and Eastern New York, 11 Warren Street, New York.

J. AUSTIN & CO.,

168 Fulton Street, N. Y.

SOLE AGENTS FOR

SCRIPTURE'S OILERS.



FRANKLIN S. MILES,

Manufacturer of

Brass, Iron, Steel and German Silver

SCREWS.

1205 Quarry Street, Philadelphia.

Jos. Scheider & Co

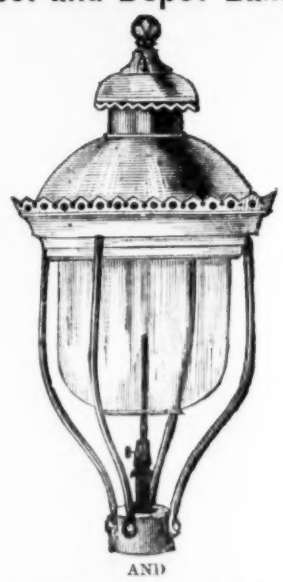
Manufacturers of

Japanned & Stamped

TIN WARE,

MINER'S PATENT

Street and Depot Lamps.



AND

PATENT SELF-RIGHTING

CUSPADORES.

THE PATENT SELF-RIGHTING

CUSPADORE

Is superseding all others. Being made of **METAL** it will not break, and as the lower part is **CAST-IRON,** will not corrode as quickly as other articles composed of sheet metal for the same purpose, and if upset, it rights itself immediately.

58 Beekman St., N. Y

P. O. Box 4291, New York.

FACTORY PORTLAND CONN.

FOR SALE BY THE HARDWARE TRADE.

SEND TO THE ENTERPRISE MANFG. CO. OF PA. FOR ILLUS. CATALOGUE

OR TO GRAHAM AND HAINES AGENTS 88 CHAMBER ST. NEW YORK.

LINFORTH, KELLOGG & CO.,

Wholesale Hardware House

AND

Manufacturers' Agents,

Nos. 3 & 5 FRONT STREET, SAN FRANCISCO., CAL.

Sole Agents for the Pacific Coast, for the following leading Goods.

The Powell Tool Co.'s Axes, Edge Tools, Picks, Mattocks, &c.
The Sandusky Tool Co.'s Planes, Plane Irons, Carpenters', Cabinet Makers' and Coopers' Tools.
The Black Diamond Files, G. & H. Barnett, Manufacturers, Philadelphia.
Rumsey & Co.'s Pumps, Hydraulic Rams, Steel Amalgam Bells, Fire Engines, &c.
The Woolworth Handle Works, Axe, Pick, Sledge and other Handles.

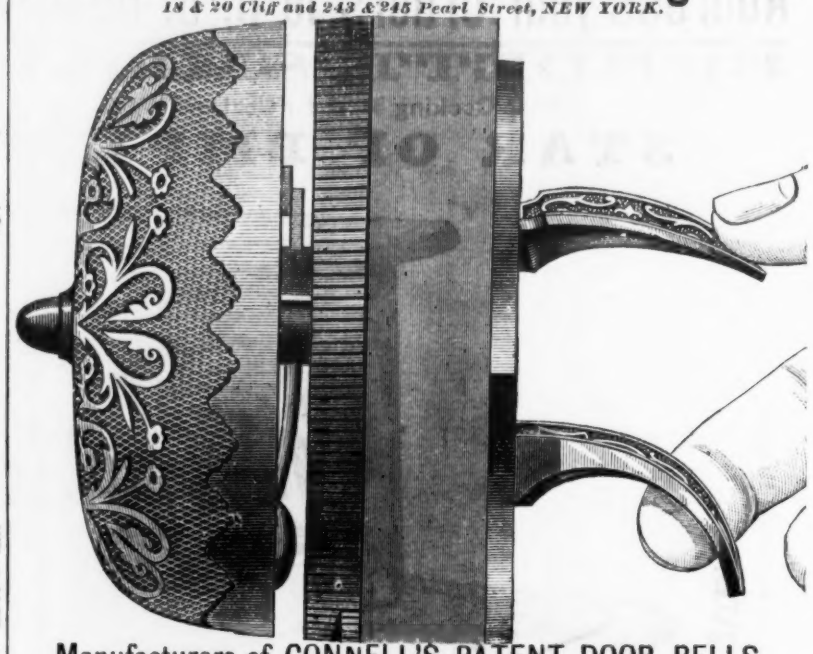
ALSO AGENTS FOR

The Enterprise Mfg. Co.'s Coffee and Spice Mills, Molasses Gates, Bung Borers, &c.
The U. S. Screw Co.'s Gimlet Pointed Screws.
The Union Steel Screw Co.'s Gimlet Pointed Steel Screws.

New York Office, 96 Chambers St., W. B. FOX, Manager.

The Hart, Bliven & Mead Mfg. Co.

18 & 20 Cliff and 243 & 245 Pearl Street, NEW YORK.



Manufacturers of CONNELL'S PATENT DOOR BELLS.

For Prices and Description, see *The Iron Age*, April 2d, page 21.

WHEELING HINGE CO.,

Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Sinks & Washers,

GRAHAM & HAINES, Sole Agents, 88 Chambers Street, N. Y.

AMERICAN BUTT CO.,

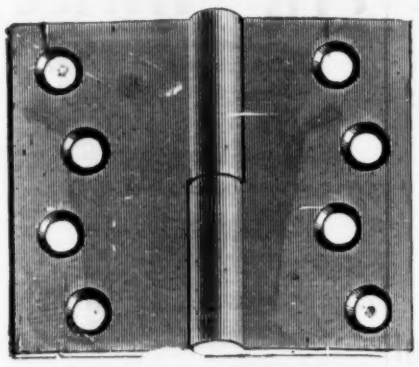
PROVIDENCE, R. I., Manufacturers of

Cast Butt Hinges

AND

BUILDERS'

HARDWARE.



New York Warehouse with

Messrs. GRAHAM & HAINES,

No. 88 Chambers Street.

Send for Price List.

Al kinds of

SMALL CASTINGS

Made to order.

Headquarters for

Henry Disston & Sons' Saws,

Hand, Mill, Circular and Cross Cut.

ALSO,

Plumbs and Levels, Try Squares, Gauges, Trowels and Barker's Reversible Butt.

A full assortment constantly on hand. Address orders to

GRAHAM & HAINES, 88 Chambers Street, N. Y.

CENTENNIAL

SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,

SOLE MANUFACTURERS,

Office, 1321 Fairmount Ave., Phila.

PATENT APPLIED FOR. Send for Circular.

BAEDER, ADAMSON & CO.,

Manufacturers of

Sand and Emery Paper and Emery Cloth

(Also, in Rolls for machine work.)

GROUND EMERY, CORUNDUM AND FLINT,

Glue & Curled Hair, Cow Hide Whips.

STORES:

PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St.,
NEW YORK, 67 Beekman St., CINCINNATI, 92 Main St.,
CHICAGO, 182 Lake St.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

Grundy & Kenworthy

HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts

SAMUEL LORING'S

PLYMOUTH TACK AND RIVET WORKS

PLYMOUTH, MASS., manufacturer of

TACKS, BRADS, NAILS AND RIVETS.

Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 2d, 2d and 3d Fine, Trunk, Clout, and Cigar Box Nails; Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c., &c., &c., COPPER, BRASS AND IRON RIVETS, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Rose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

Established in 1810.

HOBART'S TACKS.

Manufactured by

Dunbar, Hobart & Whidden,

Office and Salesroom,

116 Chambers Street, N. Y.

Factory, SOUTH ABINGTON, MASS.

Manufacturers of

American, Swedes and Copper Tacks, Tinned Leathered and Large Head Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners', Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points, Iron, Steel, Copper, Zinc and Brass Shoe Nails, **HEEL and TOE PLATES, STEEL SHANKS, and FANCY HEAD NAILS, SILVER or JAPANNED LINING and SADDLE NAILS.**

A full assortment always on hand at salesrooms, for immediate delivery if required.

Odd and irregular sizes made to order or cut from sample at short notice. Send for Price List.

AMERICAN TACK Co

MANUFACTURERS OF

Copper, Swedes, and Iron Tacks,

BRUSH, LACE AND GIMP TACKS,

Leathered, Tinned, and Iron Carpet Tacks; Finishing, Black, and Tinned Trunk Nails Hungarian and Cigar Box Nails;

COPPER and IRON BOAT NAILS

ZINC, COPPER, STEEL, and IRON SHOE NAILS 2d and 3d FINE NAILS;

Bright and Tinned Roofing Nails.

BRADS, PATENT BRADS, &c,

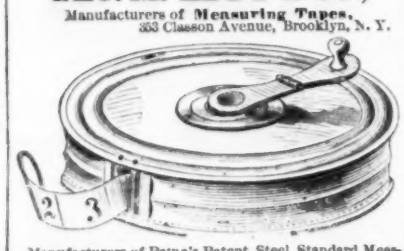
Factory, Fairhaven, Mass.

Salesroom, 117 Chambers Street, NEW YORK

N. B.—Any variation from the regular size or shap of the above named goods cut from sample to order.

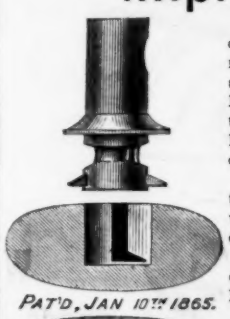
GEO. M. EDDY & CO.,

Manufacturers of **Measuring Tapes,**
353 Classon Avenue, Brooklyn, N. Y.



Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the same trades, Lumbermen, Machinists, Tailors, Shoemakers, Dressmakers, &c. Catalogues on application.

Improved Door Knobs.



On the 10th January, 1865, we obtained Letters Patent for improved method of securing necks to Mineral and Porcelain Door Knobs, which improvement was used by us long enough to prove its utility, but on account of unsettled claim of joint ownership by former partner, its use was discontinued. Having now made a further improvement, for which we have made application for a Patent, we are now making the **BEST SECURED** and **MOST DURABLE** Mineral and Porcelain Door Knobs ever offered in this or other markets.

We solicit orders for these Knobs at our regular prices for old styles, with the understanding that if any can be loosened from or gotten off the necks without breaking the tops, they may be held by the purchaser subject to our order, with expenses added.

See *The Iron Age*, of August 21st., page 11, for illustrated description of our patent **Telescope Locks and Latches,** with patent Flat **Steel Perforated Keys,**

Address

BRANFORD LOCK WORKS,

Branford, Conn.

Or, THE HART, BLIVEN & MEAD MANUFACTURING CO., Agents,

18 & 20 Cliff and 243 & 245 Pearl Streets, New York

"Easily Applied and not Liable to get out of Order."—From Report of Judges at American Institute Fair, 1872.

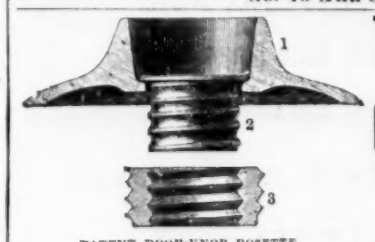
The Challenge Door Spring Co.,

Patented. Exclusive Manufacturers of the [March, 1873

In Appearance the Most Beautiful. In Action the Most Graceful. In Use the Most Reliable.

The Challenge Springs are manufactured from **Steel Wire, tempered by an Improved Process,** the result of repeated experiments, and must not be classed by dealers with the numerous worthless "Coil Springs" made from common Bed Spring Wire.

No. 49 Ann Street, NEW YORK.



PATENT DOOR-KNOB ROSETTE.

No. 1, Rosette.
No. 2, Screw entering No. 3.
No. 3, Stationary bushing remaining firmly in door.

The Wethersfield Novelty Co.

MANUFACTURERS OF

Builders' Hardware and Plated Goods.

BRASS AND IRON FOUNDERS.

Particular attention given to Light Manufacturing for outside parties; also,

BRASS & IRON FOUNDING, SILVER & NICKEL PLATING. Orders Solicited.

We would call the particular attention of the trade to our **PATENT IMPROVED ROSETTE** for Door Knobs. This Rosette does away with the small screws and *cannot* work loose. It can be applied four to one faster than any others. Can be applied to old doors.

Factory on the Valley R. R. at Wethersfield, Conn.

Communication from Hartford (2 miles) by horse or steam cars.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.—Solid Cast Steel ℘ ℔ 14c
Peter Wright's ℘ ℔, gold, 12½c
Wilkinson's 11½c
Eagle 11 cents currency—dis 15 @ 15&5 %
Apple Parers.—Reading Improved per doz $8 50
Victor, Improved " 8 25
Union " 8 00
Turn Table, " " 8 50
Discount for 25 dozen lots " 50c
Axes.—Mann's Light Per doz. $13 00 @ 14 00
Hunt's Light " 14 00 @ 14 50
Red Indian, all sizes " 12 50 @ 12 00
Red Chieftain, all sizes " 12 50 @ 13 00
Crown Prince " 13 50 @ 13 00
Augers and Auger Bits.—Pierce's Pat. Twist Bits dis 25 @ 25&5 %
Bates' & Ives' Bits dis 30&10 %
Douglass' Bits dis 30&10 %
Cast Steel Bits dis 35&10 %
Cook's Bits dis 40 %
Bonney's Pat. Hollow Augers dis 25 %
Stearn's Patent Hollow Augers dis 25 %
Russell Jennings' Bits dis 10 %
Bates' & Ives' Nut Augers dis 30&10 %
Douglass Nut Augers dis 20&10 %
Watrous' Ship Augers dis 10 %
Balances.—Landers, Frary & Clark's dis 15 %
Chattillon's dis 15 %
Morton's dis 15 %
Common Spring with Hook ℘ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg. Co. Light Hand Bells dis 60 @ 60&10 %
Other makers light dis 60 @ 60&10 %
Swiss Pattern Hand Bells dis 40 %
Connell's Door Bells dis 50 %
Great Western and Kentucky Cow dis 50&10 %
Boring Machines.—Bates' Mfg. Co., complete with augers dis 15 @ 20 %
Douglas' Mfg. Co., complete with augers dis 15 @ 20 %
Common Boring Machines, no Augers $4 25 @ 4 00
Angular " " 5 25 @ 5 00
Bolts.—Eastern Carriage Bolts dis 70&10 %
Western " " dis 70&10 %
Philadelphia " " dis 50 %
Wrought Shutter Bolts dis 45 @ 50 %
Cast " " dis 30&10 %
Skelly's Phila. Norway iron, finish, points dis 50 %
Braces.—Barber's dis 40 %
Backus dis 40&10 %
Bartholomew's American Ball dis 10&10 %
Spottard dis 40 %
Butts.—Cast Fast Joint, Narrow dis 50 %
" " Broad dis 60 %
Cast Loose Joint dis 60 %
" Acorn, Loose Pin dis 40&10 %
Wrought Loose Pin dis 35 %
" Table Hinges and Back Flaps dis 30 %
" Narrow dis 30 %
" Loose Joint dis 35 %
" Reversible dis 35 %
Parker's Blind Butts, Shepard's " ", Clark's " ", Cherrytree " " for wood — dis 50 %—dis by the case 50&5 %
Lull & Porter's " dis 25&10 %
Chains.—German Halter new gold list dis 10 %
" Coil new gold list dis 10 %
Galvanized Pump ℘ ℔ 15c
Best Proof Coil Chain—

℘ ℔	13¾	10¾	10	9½	9¼	9	8½c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 560 lbs., discount ½c per lb. Common Chain, ½c per lb. less than proof.
Chisels.—Socket Framing dis 60 @ 60&10 %
Socket Firmer dis 60 @ 60&10 %
Tang dis 40 @ 40&10 %
Beaty's Framing and Firmer dis 10 @ 15 %
Casters.—Porcelain Wheel dis 30&10 %
Iron dis 30&10 %
Brass dis 30&10 %
Clothes Wringers.—Universal per doz $72 00
Novelty " 72 00
Reliance " 72 00
Providence " 72 00
Orders for 5 dozen, discount $3 per dozen.
King Wringers (Iron Frame) per doz $68 00
Coffee Mills.—Common Box and Side dis 10 @ 15 %
Patent Box and Side dis 10 @ 15 %
Cutlery.—American Pocket (best) dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co.'s dis 60 @ 60&10 %
Concave Adjustable Handle dis 10 %
Beatty dis 10 @ 15 %
Fry Pans.
Tinned dis 20 %

℘ doz.	$3 00	3 25	3 62	4 00	4 50	5 00	5 50	6 00	7 50
No.	0	1	2	3	4	5	6	7	8

Burnished

℘ doz.	$2 60	3 00	3 38	3 75	4 12	4 50	5 00	5 62	6 75
No.	0	1	2	3	4	5	6	7	8

Files.—Nicholson Mill Files new list, $5 00 to £ cur dis 10 %
" Bastard " 5 00 to £ cur dis 10 %
" Taper " 5 00 to £ cur dis 10 %
Butcher's Mill $5 75 to £ gold
" Bastard 5 50 to £ gold
" Taper 5 50 to £ gold
Moss & Gamble—Mill, Taper and Bastard 5 50 @ 5 25 to £ gold
Fluting Machines.
K. F. M.—4½ in. rolls, $5 50 dis 10 %
" —6 in. rolls, $6 65 dis 10 %
Mrs Knox—4 in. rolls, $5 50 dis 10 %
" —6 in. rolls, 6 65 dis 10 %
Hammers.
Yerkes & Plumb's dis 15 %
Hammond & Son's dis 10 %
Veree dis 10 %
Hatchets.
Beatty's dis 10 @ 15 %
Shingling and Half. ℘ doz. $7 00 7 50 7 75 8 00 — No. 1 2 3
Yerkes & Plumb dis 10 %
Shingling and Half. ℘ doz. $7 00 7 50 8 00 8 50 — No. 1 2 3 4
Claw ℘ doz. $7 50 8 00 — No. 1 2 3
Hinges.—Strap and T, advanced Feb. 6 dis 25&7½ %
Bonney's No. 1 Gate dis 25 %
" No. 2 and 3 dis 35 %

Horse Nails.	Nos. 5	6	7	8	9	10
Ausable		27	25	24	23	22
Globe		28	26	25	24	23
Brundage		26	24	23	22	21
Putnam	32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination new list dis 45 %
Extra discount for cash 2 %
Mineral and Rim dis 5 %
Locks and Latches.—Rim and Mortise dis 45 %
Extra discount for cash 2 %
Till and Cupboard dis 25 %
American Padlocks dis 50 %
Scandinavian Pad Locks.
℘ doz. $10 50 10 50 12 00 12 00 15 00 15 00 — No. 9 9½ 10 10½ 11 11½ — dis 15 %
℘ doz. $18 00 18 00 22 00 22 00 — No. 12 12½ 13 13½ — dis 15 %
Trunk Locks dis 5 @ 10 %
Thumb and Roggens Latches dis 25 %
Lanterns.—Square Candle and Oil dis 10 %
Globe for Oil dis 10 %
" " Kerosene dis 10 %
Tubular Lanterns dis 10 %
Mattocks.—Long and Short Cutter dis 25 %
Western Pattern dis 25 %
Pennsylvania Pattern dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets dis 20 %
Stebbins' Gates dis 60 @ 60&10 %
Lincoln's " dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum dis 10 @ 10&10 %
Taylor's Petroleum Faucets dis 20 @ 20&10 %
Brass Liquor Cocks dis 20&10 %
Meat Cutters.—Dixon's dis 10 %
Woodruff dis 10 %
Stowe dis 10 %
Hale's dis 25 %
Stuffers dis 10 %
Planes.—Auburn Tool Co. "Bench" dis 30&5 %
Second Quality dis 40 %
Metallic Plane Co. dis 25&5 %
Evans Pat. Circular net
Plane Irons.—American list net
Butcher's gold £, $5 50
Picks.—Philadelphia net
Pittsburgh net
Plumbs and Levels.
Stanley Rule and Level Co. dis 60 @ 60&10 %
Wm. Johnson, (Stanley List) dis 60 @ 60&10 %
Rakes.—Cast Steel Garden dis 33⅓ %
Malleable Garden dis 33⅓ %
Wood Head Iron Teeth dis 30 @ 40 %
Rules.—Stanley Rule and Level Co. dis 60 @ 60&10 %
Steven's and Hubbard's dis 60 @ 60&10 %
Steelyards.—American Pattern dis 15 %

℘ doz.	$5 50	7 00	9 00	10 00	11 00	12 00
No.	50	100	150	200	250	300

English Pattern dis 15 %

℘ doz.	$7 00	8 67	10 67	12 67	14 67	16 67
No.	50	100	150	200	250	300

L. F. & C. Excelsior dis 10 %

℘ doz.	$9 00	10 00	12 00	15 00	18 00	21 00
No.	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ℘ doz. $11 00 net
Clipper No. 10, Boxed and Sharpened ℘ doz $10 50
" " 5, " " 10 00
Common Scythes ℘ doz $7 00 @ 10 00
Squares.—Steel and Iron, new list dis 50 %
Saws.—Disston's Cross Cut dis 12½ %
Disston's Hand dis 12½ %
W. McNiece's H'd, Cross-Cut & Circ'r, new list dis 15 %
Boynton's Lightning, new list dis 30 %
Shovels and Spades.
Rowland's Plain Back, list Feb. 1873 dis 20&10 %
" Back Strap dis 20&10 %
Oliver Ames & Sons new list dis 12½ %
Brady Shovel Co. dis 12½&5 %
Sad Irons.—Richmond (polished face) per lb. 4⅛c. net
Coquanock (polished face) " 4⅜c. net
Stone.—Arkansas Oil, No. 1 ℘ ℔ $1 38
Turkey Oil, No. 1 " 1 00
Washita Extra " 80c
" No. 1 " 22c
" " 2 " 18c
Hindostan 8 in. " 5½c
" Axe " 7c
Screws.—Iron new list, Jan. 1st, 1874, dis 52½ %
Brass dis 52½ %

Spoons.—
Plated Spoons, Rogers Bros.' new list dis 30 @ 30&5 %
Britannia Spoons dis 40 @ 40&5 %
German Silver new list dis 10 @ 15 %
" Light new list dis 15&5 %
Lalance & Grosjean Iron dis 10 %
Springs.—Gray's Door dis 40 %
Torry's Door dis 40 %
Stocks and Dies dis 15 %
Stove Polish.—Gem ℘ gross, $5 00
Onyx $5 00
Try Squares.—Winterbottom dis 10 @ 15 %
Stanley Rule and Level Co. dis 45&10 %
Willis Thrall, No. 2 dis 30&10 %
Disston's No. 2 dis 40 %
Tacks, &c.—Half Weight Tacks dis 70 %
" " by the case dis 70&7½ %
Clout and Finishing Nails 7½ %
" " " by the case dis 7½ %
Traps.—Genuine Oneida—Newhouse list dis 20 %
Imitation " " " dis 30 %
Vises.—Solid Box ℘ ℔ net 15c
Wrenches.—Coes Genuine dis 40 %
Coes Imitation Wrought Bar dis 50 %
" " Malleable Bar dis 60 %
" " (Kellogg) Malleable Bar dis 50 @ 10 %
Tafts Pattern (Wrought Bar) 65 %
" " Kellogg's (Nail Bar) dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex dis 25 %
" " " Improved Baxter dis 25 %
" " " Adjustable Fork dis 25 %
Wire.—No. 0 to 18 dis 37½ @ 40 %
No. 19 to 26 dis 40 @ 42½ %
No. 27 to 36 dis 45 @ 47½ %
Coppered 0 to 12 dis 15 @ 20 %
Tinned Broom Wire dis 20 %
Galvanized Wire No. 0 to 18 dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

April 11, 1874.

Augers—C. S. Cut, French, Swift & Co. dis 30&10 %
Bits, Auger—Pierce's dis 30 %
Snell Mfg. Co. dis 20 %
Jennings dis 10 %
Bells, Cow—Yaw's Genuine dis 25 %
Bolts—Carriage and Tire dis 75 %
Braces—Bit, Spofford's Patent dis 40 %
Brads, Cut dis 50&7½ %
Boards—Stove, Brooks' Patent dis 30 %
Butts—Brass dis 25 %
Cast Loose Joint dis 60 %
" " Pin dis 45 %
" " " Japanned dis 45 %
" " " Silver Tipped dis 25 %
Wrought Narrow dis 30 %
" Broad, Loose Joint dis 35 %
" Table and Back Flaps dis 30 %
Wrought Butts, Loose Pin dis 35 %
Belting—Rubber dis 30 @ 30&5 %
Leather new list dis 30 @ 30&5 %
Beaters, Egg, "Peerless" per doz $4 00
Brick—Bath (box of 2 doz) Best English $1 50
"Rutherford" $1 00
Chalk—White, Carpenter's ℘ gross, 50c
Red, Carpenter's " 75c
Blue, " " 90c
Chisels—Firmer Socket dis 60&10 %
Framing Socket dis 60&10 %
Corner Socket Chisels dis 60&10 %
Slick's Carpenters' dis 60&10 %
Castings—Malleable ℘ ℔ 10½c
Cherry Seeders per doz $12 00

Elbows—Corrugated	5	5½	6	7	
Charcoal	$4 25	5 25	5 25	6 50	dis 10 %
Russia	10 00	13 00	13 00	14 00	

Files—Malschoss Bros. dis 50 %
Freezers, Ice Cream—"Champion" dis 33⅓ %
Hinges—Window Blind—
Clark's No. 20 55&10 %
Shepard's Standard, and Clark's dis 50 %
Wrought Strap and T dis 55&7½ %
Hods, Coal—Plain, Black and Galvanized dis 10 %
Funnel, Black and Galvanized dis 10 %
Fancy and Helmet dis 10 %
Palace Coal Vases net
Hooks and Staples—Wrought dis 60&10 %
Hooks—Belt dis 50 %
Hasps and Staples—Wrought dis 60&10 %
Sad Irons 4½c
Kettles—Brass ℘ ℔ 50 @ 55c
Enameled dis 45 %
Knives, Drawing—Oval No. 1 dis 60&10 %
Razor Blade dis 50&10 %
Lanterns "Peerless," No. 1 5 10 — ℘ doz $26 00 $11 25 $13 75 dis 10 %
Gem, with guards $6 50
Tubular 11 50
" with Guards 12 00
Machines—Apple Paring, "Turn Table" 8 50 ℘ doz
Mills, Coffee—Box and Slide, common dis 10 %
Box Union and Eagle dis 10 %
"American dis 20 %
Nails—Clout and Finishing dis 7½ %
Shoe dis 7½ %
Horse, Ausable No. 5 6 7 8 9 10 — 30 27 25 24 23 22c
" " Finished & Pointed add 1c ℘ ℔
" " 1000 lbs. dis 5 %
" Clinton No. 6 7 8 9 10 — 22 20 19 18 17c
Packing—Rubber dis 30 @ 30&5 %
Pencils, Slate—Soapstone 4 5 6in. — 30 40 50c. ℘ 100
Case lots dis 20 %
Paint—White Lead, U. S. Gov't ℘ ℔ 9 c
Rivets—Iron, Black and Tinned dis 20 @ 25 %
Copper dis 10 %
Rope—Manila, ½ inch and larger ℘ ℔ 16½c
Rules—Boxwood and Ivory, Stephens dis 60 %
Screws—"American Screw Co"—
Flat Head, Iron dis 52½ %
Flat Head, Brass dis 52½ %
Staples—Blind, Boardman's Pat., ⅝ & ¾ ℘ ℔ 37c
Spoons, Iron Tinned dis 10 %
" " by the case dis 20 %
Plated Rogers' A No. 1 dis 30&5 %
Britannia dis 40 %
Squares—Steel and Iron new list 50 %
Shoes, Horse—H. Burden & Sons ℘ keg $6 00
Shovels & Spades—Shepard, Forsyth & Dennison dis 20 %
Saws—Henry Disston & Sons dis 10 %
Scales—Buffalo Scale Works dis 25 %
Fairbanks dis 15 %
Shears—Seymour's dis 60 %
Traps, Steel—Newhouse dis 20 %
Tacks—Half Weight Am. Iron dis 70&7½ %
Vises—Parallel, Buffalo dis 20 %
Wrenches—Coes' genuine dis 40 %
Coes' Imitation dis 50&10 %
Tafts' Pattern dis 65&10 %
Ware—French, Tinned and Iron dis 30
Stamped and Japanned net
Cast Iron Hollow dis 30 %
Tin Plates.—Add for each X 2 50

10x14, IC. Charcoal	$12 50	14x20 IC. terne		11 50 @ 11 75
12x12, "	13 00	20x28 C.	"	25 00
12½x17, "	12 00	20x28 X.	"	29 25
14x20, "	13 50			

Pig Tin—Straits 33c @ 34c
Bar Tin 35c
Solder No. 1, 19c; No. 2, 17c
Sheet Zinc—
"Lasalle" 570 100 ℔ casks — $10 00 10 30 ℘ 100 ℔s
Sheets $10 00
Iron Wire—Bright and Annealed dis 35 %
Coppered dis 30 %
Tinned dis 15 %
Tinned Broom, Nos. 20 21 22 — 20c 21c 21c dis 30 %
Copper—Sheathing 14 @ 18 oz. ℘ ℔ 33c
Planished ℘ ℔ 39 @ 41c
Bottoms ℘ ℔ 35c
Bolts ℘ ℔ 35c
Braziers' Sheets ℘ ℔ 35c
Sheet Iron.—
18 Common $5 10
24 Common 5 30
24 W. D. Wood & Co., Smooth Finish 6 10
Am. Russia A. 14½c B. 11c
Gen. Russia, No. 1 stained 20c
" " clean 21c
Galvanized dis 15 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal $ @ 13 00
I. X. 10x14 Charcoal @ 17 00
I. C. Terne 14x20 11 00 @ 12 00
I. C. Terne 20x28 25 00 @ 26 00
I. C. Continuous 26 00
Block Tin.— Pigs 35c | Bars ℘ ℔ 36c
Solder.— S. & Co. ℘ ℔ 26c | A 1 ℘ ℔ 20c | Roofing " 23c
Lead.—Pig ℘ ℔ 7c. | Bar ℘ ℔ 8c
Copper.—
Ingot ℘ ℔ @ 27c | Sheets, 6 to 9 lb. ℘ ℔ 41c
Planished " @ 44c | " 10 to 12 lb. " 38c
Sheathing " @ 35c | Braziers 13 lb. " 35c
Copper Drops @ 35c | Copper Bottoms " —
Zinc. Cask, 500 to 1000 lbs. ℘ ℔ 10 c
Case, 100 lbs. " 11 c
Slab " 7½c
Brass.—
Roll, No. 6 to 30 ℘ ℔ 30c | Roll, No. 38 to 40 ℘ ℔ 50c
" 30 to 38 " 40c | Wire, No. 0 to 20 ℘ ℔ 40c
| " 20 to 25 " 45c
Babbit Metal.—
Sellew & Co. ℘ ℔ 35c | Allens' ℘ ℔ 25c | Market 12c
Antimony ℘ ℔ 18c
Bismuth ℘ ℔ $6 00
Nickel ℘ ℔ $2 50

Sheet Iron.—
Gem Russia ℘ ℔ 22c | Am Russia A ℘ ℔ 14c | " " B " 11c

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'fd.
15 to 20	5 2c	6 4c	7 4c
22 to 24	5 4c	6 6c	7 6c
26	5 6c	6 8c	7 8c
27	5 8c	7 c	8 c

Galvanized Iron.—Full bundles dis 20 %
Nos. 18 to 20 12c | No. 26 14c
22 to 24 13c | 27 15c
Bar Steel.—Silver, ℘ ℔ 16c; Crescent, 21c.
Iron Wire dis 45 %
Enameled Ware dis 35 %
One Piece Corrugated Elbows dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch	℘ doz $2 50	4½ inch	℘ doz $5 00
5 "	3 50	5 "	7 00
5½ "	4 50	5½ "	9 50
6 "	5 25	6 "	12 00
7 "	6 50	7 "	14 00

Leader Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	℘ doz.		℘ doz
2-inch	$1 75	2½-inch	$2 75
3-inch	2 25	3½-inch	3 25
4-inch	2 50	4½-inch	3 50

Sheet Iron Bread Pans ℘ ℔ 10
American Broilers ℘ doz. $12 00
Tinmen's Machines dis 5 %
Sad Irons ℘ ℔, 4 c
Brass Kettles.—Ansonia 55c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips:

Iron, standard list, assorted sizes, for large orders, 3c, card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk 4 7c ℘ ℔ net
Iron Wedges 4½c ℘ ℔ net
Norway Nail Rods 9½c ℘ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point) 5½c ℘ ℔ net
Beetle Rings 9¼c ℘ ℔ net
Fence Pickets—
⅝ round, bent to shape 30c ℘ ft. of fence, less 15 % off net.

Discount off Standard List.
Carriage and Tire Bolts (new list) 70&5 % off net
Plow Bolts 30&10 % off net
Stove Bolts 10 % off net
Machine and Square Head Bolts 30&5 % off net
Coach and Lag Screws 30&5 % off net
Bolt Ends 30 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅜ in. 7 c ℘ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in. 5½c ℘ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in. 8 c ℘ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in. 6 c ℘ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ℘ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ℘ ℔ ex. Nuts and Washers in 5 lb. boxes, 1½c. ℘ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¼c ℘ ℔ net; ⅞, ¾ in. diam. 3⅝c ℘ ℔ net; ⅝ in. diam. 4½c ℘ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ½c ℘ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅜ in. diam. 6c ℘ ℔ net; 9-16 in. diam. 7c ℘ ℔ net; ½ in. diam. 8c ℘ ℔ net. 1c ℘ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ¾ to 1 in. diam. 9c ℘ ℔ net; ⅝ in. diam. 10c ℘ ℔ net; ½ in. diam. 12 c ℘ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to 36 in. long, 5½c ℘ ℔ net; 8, 10 & 12 in. long, 7c ℘ ℔ net.
Strap and T Hinges, 25 & 7½ % off net, delivery as customary.
Screw Hitching Rings $5 50 ℘ 100 net
Duck Nest Tuyere Irons $15 00 ℘ doz net
Cast Iron Washers ℘ ℔ 4½c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long ℘ ℔ 4½c net
1 to 2 in. diam. from 4 to 8 ft. long " 4½c net
1 to 2 in. diam. from 1½ to 4 ft. long " 5c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long " 5½c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 5⅞c net

WAGON HARDWARE.

Wagon Box Strap Bolts—

Length		Screw End			Price
10 in. long by		7-16 at Screw End,	℘ set of	8 bolts	55c
12	"	½	"	8 "	70c
10	"	9-16	"	8 "	90c
12	"	9-16	"	8 "	
14	"	9-16	"	8 "	$1 00
10	"	⅝	"	8 "	1 00
12	"	⅝	"	8 "	
14	"	⅝	"	8 "	1 10
16	"	⅝	"	8 "	1 20

5c ℘ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each 18c
" " wide track, each 20c
Single Tree Irons, ℘ set of four pieces 38c
Wrought Iron Bolster Plates, 2¾ in. wide, ℘ set 60c
" " 3 " " 65c
" " 3¼ " " 70c
" " 3½ " " 75c
Wagon Brake Ratchets, each 16½c
" " finished with guard, each 45 c
Wrought Hammer Straps, heavy pattern, each 16 c
" " light " each 13½c
" Rub Irons, each 11 c
Stay Chain Hooks, each 8 c
Double and Single Tree Clips, figure 1, each 9 c
" " 2, each 10 c
" " 3, each 12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 100 sets dis 25 %
Wagon Box Staples, 1½ to 2½ in. to clinch ℘ 1000 $12 00 net
" " Box Iron, to rivet on ℘ 1000 8 00 net
Neck Yoke Eyes, each 5c net
" " with ⅜ rings, each 7⅝c net
King Bolts, ¾, 1, 1⅛, and 1¼ in. diam ℘ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths " 9 c net
Wagon Rivets, 3-16 in. diam., all lengths " 11 c net
" & Nails, in 5 ℔ paper boxes ℘ ℔ 1c extra
" " in 25 ℔ wood " ½c extra
Wagon and Hinge Nails, ¼ in. ℘ ℔ 17 c net
" " " 3-16 in. " 19 c net
Double Tree Plates, Coupling ", Tongue " — " 9 c net
Neck Yoke Plates " 12 c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ℘ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in. ℘ ℔ 11 c net ¼ in., 12 c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal
IC, 10x14 $12 50
IX, 10x14 15 25
XX, 10x14 18 00
IC, 12x12 13 00
IX, 12x12 15 75
IC, 14x20 13 50
IX, 14x20 16 25
XX, 14x20 19 00
XXX, 14x20 21 75
XXXX, 14x20 24 50
DC, 100 Plate 12 00
DX, " 14 75
DXX, " 17 50
DXXX " 20 25
DXXXX 100 Plate 23 00
IX, 14x14 24 50
IC, 10x14 W 12 00
IX, 10x14 W 14 75
Roofing Tin.—Best Char.
IC, Terne, 14x20 $11 50
IX, " 14x20 14 25
IC, Terne, 20x28 23 00
IX, " 20x28 28 50
Coke Tin.—
IC, 10x14 Coke $10 50
IX, 10x14, Coke 13 25
IC, 14x20, " —
Sheet Zinc.—
Any width 9½c
Copper.—
Sheathing 33c
Copper Bottoms 35c
Planished Copper.—
Sheathing, 14x48 41c
Boiler Size, No. 7 43c
" " No. 8 43c
" " No. 9 43c
Tinning ℘ sheet, 14x48 10c
" " No. 7 12c
" " " 8 14c
" " " 9 16c
Pig Tin.—
Large Pigs 32c
Small Pigs 33c
Bars 30c
Solder.—No. 1 19c
No. 2 18c
Bright Wire dis 37½ %
Sheet Iron.—
No. 18 Am. Com 5 50
No. 24 Am. Com 5 50
Pat. Am. Russia "A," Nos. 24, 25 & 26 14½c
Russia, Nos. 9, 10, 11 & 12 21c
Pat. Planished Russia c
Russia No. 9, 10, 11&12 c
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $6 10
" 21 to 24 6 30
" 25 & 26 6 50
" 21 to 24 Char'l 7 80
" 25 & 26 " 8 00

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If, after a fair trial, it does not, we will take it off at our own expense.

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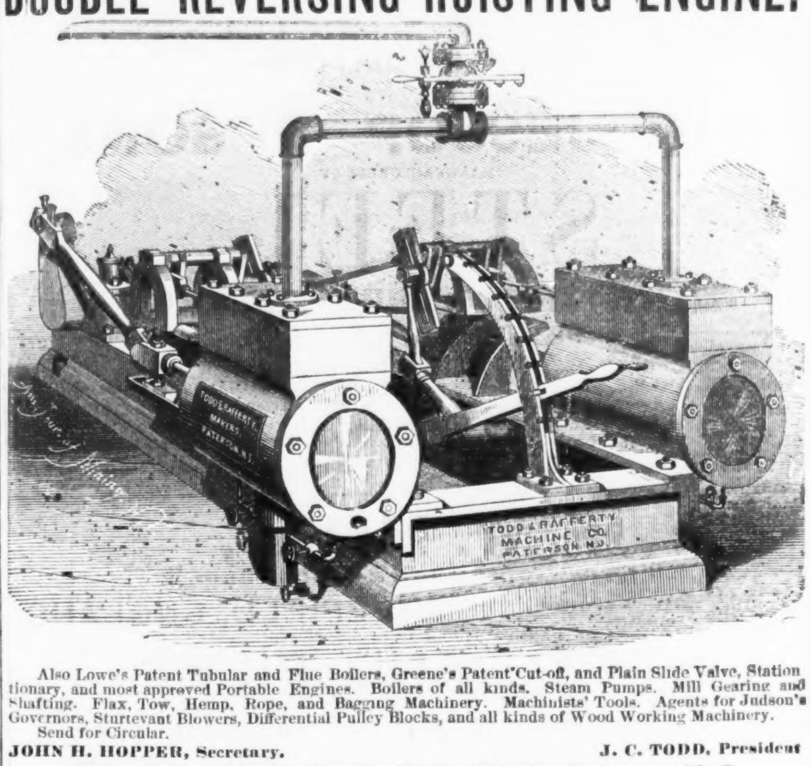

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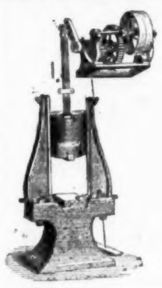

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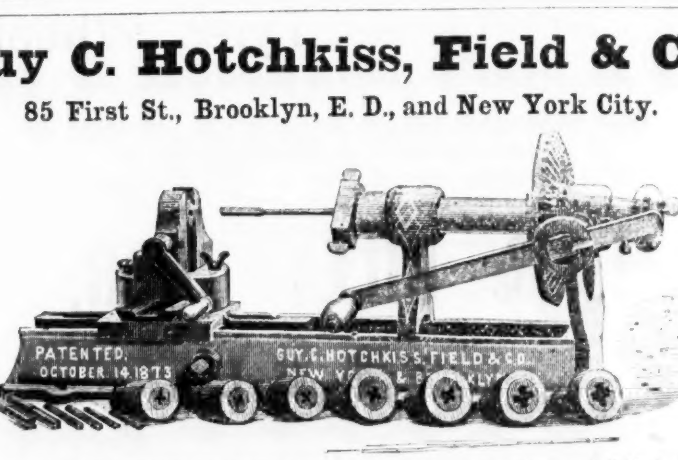

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This machine has revolving and sliding jams, which enables the operator to cut all kinds work no matter how irregular in shape it may be. It cuts a perfect thread at once going over. As much work can be done in one hour by this machine as in a day with stocks and dies. Send for Circular.

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MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1ª UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

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Bailey Lane Works, Sheffield, England.

Warehouse, 82 John St., New York.

Established 1810.

HENRY MOORE, Attorney.

Steel.

SANDERSON BROTHERS & COMPANY,

(LIMITED)

MANUFACTURERS OF THE

CELEBRATED CAST STEEL,

Warranted Most Superior for Tools and Granite Rock Drills.

DARNALL WORKS, ATTERCLIFFE FORGE, WEST STREET WORKS, } SHEFFIELD, ENGLAND.

IMPORTERS OF FILES,

AND

AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.

NEW YORK, Edward Frith, 16 Cliff.
BOSTON, H. L. Richards, 18 Batterymarch.
PHILADELPHIA, Wm. H. Sowers.
CLEVELAND, O., Cleveland, Brown & Co.
NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BALTIMORE, Md., Wm. H. Cole.
MONTREAL, Saint Paul St.
NEW HAVEN, Ct., Atwater, Wheeler & Co.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

JOHN HOGAN, Agent.

S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the patronage of Europe and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed

---

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills, &c.**

Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

☞ *Makers of the Celebrated ROCK BORING DRILL STEEL.*

Warehouse, 57 John Street, New York.

JOHN A. GRISWOLD & CO.,

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Office in New York City, 56 BROADWAY.

MANUFACTURERS OF

Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFTING,

Railroad Iron, Pig Iron, Merchant and Ship Iron,

AGENCIES IN BOSTON AND PHILADELPHIA.

D. G. GAUTIER & CO.,

MANUFACTURERS OF

Hammered and Rolled STEEL of every description

JERSEY CITY, NEW JERSEY.

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CHROME STEEL COMPANY,

MANUFACTURERS OF

CHROME CAST STEEL,

WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—FOR EVERY PURPOSE.

Works and Offices—Kent Avenue and Keap Street, Brooklyn, E. D., N. Y.

Principal Agencies:

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Steel.

Sheffield Steel Works.

(Established in 1848.)

SINGER, NIMICK & CO.

Pittsburgh, Pa.,

Manufacturers of **Extra Quality Tool**

CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel,

Elliptic and Side Springs, Seat Springs.

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, ow Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS & SONS,

Minerva & Beaver Iron & Steel Works

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MANUFACTURERS OF

"Jenks" Spring Steel, Cast and Swedes Spring Steel,

TIRE, TOE CORK, SLEIGH SHOE, BLISTER & PLOW STEEL.

Also, Plow and other Iron.

VAN WART & McCOY, Agents,

43 Chambers St., New York.

A full assortment of "Jenks" Spring Steel in stock.

MILLER, BARR & PARKIN,

Orescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.,

PITTSBURGH, PA.

Gunpowder.

GUNPOWDER

DUPONT'S

Sporting, Shipping, and Mining

POWDER.

DUPONT'S GUNPOWDER MILLS

ESTABLISHED IN 1801,

Have maintained their great reputation for years. Manufacture the

Celebrated Eagle Ducking, Eagle Rifle and Diamond Grain Powder.

Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER

of all kinds and descriptions.

For sale in all parts of the country.

ed by

F. L. KNEELAND

70 Wall Street, NEW YORK.

GUN-POWDER

LAFLIN & RAND POWDER CO.

21 Park Row, New York,

invite the attention of the the Hardware Trade to their facilities for delivering

BLASTING, MINING and RIFLE

POWDER

IN EVERY PART OF THE UNITED STATES from having agencies and magazines at all prominent points, beside our works at

Newburg, Saugerties, Kingston, and Catskill, N. Y.; Scranton, Carbondale and Pottsville, Pa.; Baltimore, Md., and Platteville, Wis.

The superiority is well known of our brands Rifle Powder

Orange Rifle, Orange Ducking, Lightning, Audubon.

SAFETY-FUSE at wholesale.

Steel.

HUSSEY, WELLS & CO.

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL,

INCLUDING

Best Refined Steel for Edge Tools.

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

Railroad Supplies, Homogeneous Plates

FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

Smoke-Stack Steel, Cast Steel Forgings for Crank Pins, Car Axles, &c.

ALSO, MANUFACTURERS OF THE CELEBRATED BRAND

"Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railroad Cars & Locomotives.

PENN AND SEVENTEENTH STS., PITTSBURGH, PA.

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Pittsburgh Steel Works.

ESTABLISHED IN 1845.

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BEST REFINED CAST STEEL,

Cast and German Plow and Spring Steel,

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W. F. POTTS, SON & CO., 1225 Market Street, Philadelphia.

LABELLE STEEL WORKS!

REITER, LAVELY & CO.,

MANUFACTURERS OF ALL KINDS OF

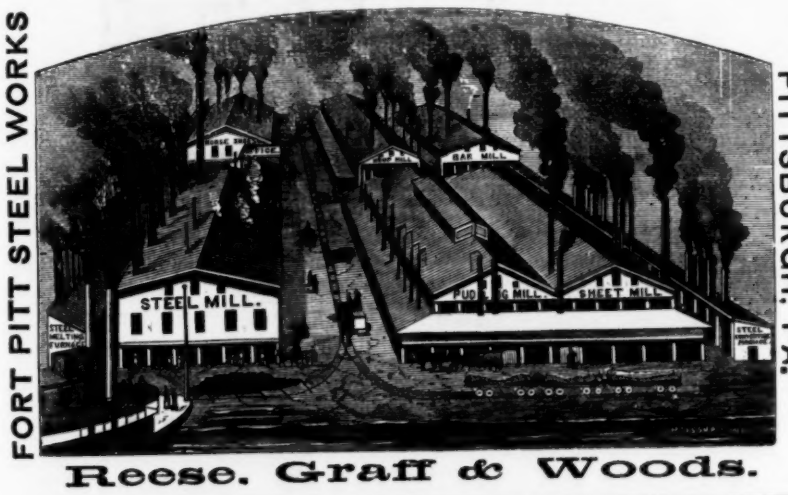
STEEL.

Also, Springs, Axles, Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, Pittsburgh, Pa.

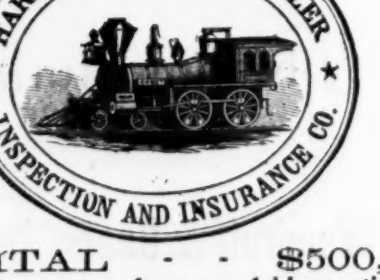
FORT PITT STEEL WORKS



PITTSBURGH, PA.

Reese. Graff & Woods.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.



CAPITAL - - $500,000.

Issues Policies of Insurance, after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

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THEO. H. BABCOCK, Manager,
New York Branch, No. 1 Park Place.

CHICAGO.

(Reported by Markley, Alling & Co.)

Agricultural Implements.—
Scythes—Dunn Edge Tool Co.....dis 30 %
Hay and Manure Forks—Otsego extra C. S.....dis 30 %
Hoes and Garden Rakes—Jackson and Otsego...dis 30 %
Scythe Stones.....dis 25 %
Scythe and Bush Snathes.....dis 25 %
Harvest Rakes and Barley Forks.....dis 25 %
Revolving Horse Rakes.....dis 25 %
Handles—Fork and Shovel.....dis 25 %
Cradles—Nithington, Cooley & Co.....dis 25 %
—Genuine Morgan.....₩ doz net $34 00

Augers and Bits.—
Ives' extra C. S....dis 30 % | Snell's.....dis 10 %
Jennings'.....dis 5 % | " Car Bits.....dis 10 %
Cook's.....dis 30 %

Axes.—Amoskeag Yankee.....₩ doz $13 50
Amoskeag Crescent..... " 14 00
Hunt's Bronzed..... " 13 00
Kennebeck Yankee..... " 12 00
Lippincott " ..... " 13 00
" Crown..... " 14 00
" Beveled..... " 14 50
Jefford's Silver Steel..... " 13 00
Red Warrior, Beveled..... " 14 00
Kennebeck, Handled..... " 15 00
Boy's, Handled..... " 12 00

Bolts.—Carriage and Tire.....dis 70&20 %
Cast Barrel and Shutter.....dis 20&10 %
Wrought Iron Barrel.....add 10 %
" " Square.....net list

Butts.—Cast Fast Joint, Narrow.....dis 30 %
Cast Fast Joint, Broad.....dis 30 %
" Loose Joint.....dis 50&5 %
" " Pin, Reversible.....dis 40 %
" " Japanned.....dis 35 %
" " Silver Tipped.....dis 35 %
Wrought Narrow, Fast Joint.....dis 30 %
" Broad " .....dis 30 %
" " Loose " .....dis 30 %
" Loose Pin.....dis 30 %
" Table.....dis 30 %
" Brass.....dis 10 %
Garretson's Blind Butts, Wood.....doz sets $1 75
" " Brick.....doz sets 2 75
Parker's " Wood.....doz sets 1 85
" " Brick.....doz sets 2 75

Casters.—Iron Plate.....dis 25 %
Brass Wheel Plate.....dis 25 %
Porcelain Wheel Plate.....dis 25 %
" " Bed.....dis 25 %
Iron Wheel Bed.....dis 25 %

Chisels.—Butcher's Tanged Firmer.....dis 30 %
" Long Paring.....dis 30 %
Witherby Socket Framing.....dis 50&20 %
" " Framer.....dis 50&20 %
" " Corner.....dis 50&20 %
" " Slicks.....dis 50&20 %

Coffee Mills.
Box 4 Iron.....$ 3 75 | Box 85 Cast Steel.....$12 00
" 103 " ..... 5 25 | Side 50..... 4 75
" 102 " ..... 6 25 | " 60..... 5 75
" 107 Britannia... 7 50 | " 70..... 7 25
" 106 " ... 8 50 | " 90..... 18 00
" 25 Union..... 10 50 | " 15 Union..... 7 00
" 35 " ..... 12 00 | " 20 " 8 00
" 75 Cast Steel.. 10 50

Cutlery.—American Table.....dis 20 %
" Pocket.....dis 25 %

Door Springs.—Torry.....₩ doz $5 00
Rubber..... " 4 00
Boon's..... " 5 00

Drawing Knives.—Witherby Tool Co....dis 50&20 %
Ohio Tool Co.....net list

Files.—Butcher's.....$7 00 £
Nicholson's.....$5 00 @ $5 50 £

Hammers.—
Maydole's.....net list | Yerks & Plumb.....net list
| Cheney.....net list

Handles.
Extra Axe...₩ doz. $3 00 | Coal Pick, No. 1..₩ doz $2 00
No. 1 Axe.... " 2 25 | Sledge, No. 1.... " 2 00
No. 2 Axe.... " 2 00 | Hatchet..... " 65
R.R. Pick, No. 1 " 2 00 | Hammer, A. E.. " 65

Hatchets.—
| 1 | 2 | 3
Amoskeag Shingling.....$7 25 | $8 00 | $8 75
" Claw..... 7 75 | 8 50 | 9 22
" Lath..... 7 50 | 8 25 |
" Solid Steel..... 12 00

Hinges.—Strap and T.....dis 25&7½%
Screw Hook and Strap, 6 to 12 in.....net, 9c. ₩ ℔
" " 14 to 24 in.....net, 7½c. ₩ ℔
Hook and Eye Hinges.....net 12c. @ 16c. ₩ ℔
Gate, No. 33, State.....₩ doz $3 50
" No. 3, In and Out..... " 3 50
" Blinn's Pat..... " 7 50

Horse Nails.—Northwestern, 8d.....24c
Ausable, 8d.....24c
Globe, 8d.....26c

Kettles.—Brass.....54c | Enameled.....dis 30 %

Locks and Knobs.—
Norwalk Lock Co. dis 45 % | EagleLock Co.....dis 15 %
Branford " ..dis 45 % | Am. Pad Locks.....dis 35 %
| Cont'al Lock Co. ..dis 10 %

Meat Cutters.—
Haven's Patent ...net list | Woodruff Patent ...net list
Hale's " ...dis 10 % | Stowe's Sausage Stuffers .....net list
| Enterprise Patent...dis 5 %

Molasses Gates.—
Stebbin's Patent ..dis 50 %

Nails.—10d to 60d.....per keg $4 00

Oil Stones.—Washita No. 1.....net 30c ₩ ℔
Washita Slips.....net 60c "
Hindostan No. 1.....net 9c "
" Axe.....net 10c "
" Slips.....net 15c "

Picks and Mattocks.—Picks, Railroad.....
Axe Finish.....₩ doz $12 00
Picks, Coal, Axe Finish..... " 10 00
Mattocks, L. C., Axe Finish..... " 15 00
" S. C., " " ..... " 14 50
Grub Hoes, Axe Finish, No. 2..... " 1 00

Planes.—Ohio Tool Co., Bench.....dis 30 %
Sciota.....dis 35 %
A. Howland & Co., Bench.....dis 30 %
" " Fancy.....dis
Bailey Patent Iron.....dis 15 %
Plane Irons, Butcher's.....dis 30 %

Rivets.—Iron.dis 10 @ 15 % | Copper, No. 7. net, ₩ ℔, 50c
Tinned.....dis 10 @ 15 %

Rules.—Stanley Rule and Level Co.....dis 50&10 %
Hubbard & Curtiss Mfg. Co.....dis 50&10 %

Sad Irons.—Best A No. 1..... ₩ ℔, 4c
" Copper Face Star..... ₩ ℔, 4¼c

Sandpaper.
Baeder & Adamson's No. 0 to 1¼ ...per ream, net $4 50
" No. 2 to 3..... " net 5 00
Wiggins & Stevens, No. 0 to 1¼..... ₩ ream, net, $4 50
" " No. 2 to 3..... " " 5 00

Sash Locks.—Champion.....₩ gross, net, $12 00
Hopkins & Dickinson.....dis 10 %
Judd's Patent.....dis 10 %
Corbin's Patent.....dis 10 %
Clark's Patent.....dis 30 %

Saws.—H. Disston & Sons.....dis 10 %
Champion X Cut.....₩ foot, net, 60c
M. A. & Co. X Cut..... " " 50c
Lightning Cut..... " " 66c

Screws.—American Screw Co.—Iron...new list dis 50 %
American Screw Co.—Brass.....dis 50 %

Shovels and Spades.
Ames' Black Shovels.....₩ doz $14 50
" Polished " ..... " 15 50
" Patent " ..... " 18 00
Alling " " ..... " 16 00
" " Molders'..... " 18 00
Crane's Black " ..... " 11 50
" Polished " ..... " 12 00
Smith's " " B. S. L. H. Rd. Pt.... " 13 50
" " " B. S. D. H. Rd. Pt.... " 14 00
Ames' Black Spades..... " 16 00
" Polished " ..... " 17 00
" Patent " ..... " 17 50
Alling " " ..... " 16 00
Crane's Black " ..... " 12 50
" Polish'd " ..... " 13 50

Scoops.—Alling Steel Polished, No. 3.....₩ doz, $13 50
Alling Steeled Polished, No. 3..... " 14 00
" " No. 4..... " 14 50
" " No. 5..... " 15 50
" " No. 6..... " 16 50
" " No. 7..... " 17 50
" " No. 8..... " 18 50
" " No. 10..... " 21 50
Crane's Polished, No. 5..... " 13 50
" No. 6..... " 14 50
" No. 7..... " 15 50
" No. 8..... " 16 50
Crane's Black Coal, No. 4..... " 17 50
" " No. 5..... " 18 00
Preston, Black Scoops No. 1..... " 12 00
" " No. 2..... " 12 50
" " No. 3..... " 13 00
" Half Pol. Scoops No. 1..... " 12 50
" " No. 2..... " 13 50
" " No. 3..... " 14 50
Lippincott, Half Pol. No. 2..... " 15 00
" No. 3..... " 16 00

Wrenches.—Taft's.....dis 60 %
Coe's Imitation.....dis 50 %
Coe's Genuine.....dis 30 %

Wringers.—Novelty Clothes Wringer.....₩ doz $69 00
Universal Clothes Wringer..... " 69 00

Chicago Metal Market.

(Reported by Cragin Bros. & Chandler, 141, 143, and 145 Lake St.)

Tin Plate.—
IC, 20x14, Coke.....$11 50 | IXXX, 14x20, " ... 22 50
IC, 10x14, Charcoal. 12 50 | IXXXX, 14x20, " ... 25 50
IX, 10x14 " . 15 50 | IX, 14x14, " ... 27 00
IC, 12x12, " . 13 00 | DC, 100 Plate, " ... 12 50
IX, 12x12, " . 16 00 | DX, " ... 15 50
IC, 14x20, " . 13 50 | DXX, " ... 18 50
IX, 14x20, " . 16 50 | DXXX, " ... 21 50
IXX, 14x20, " ... 19 50
IC, 14x20, Coke Roofing.....
IC, 10x20 Coke, for Gutters..... 19 50
IC, 14x20, Charcoal Roofing..... 12 00
IX, 14x20 " 15 00
IC, 20x28, " 25 00
IX, 20x28, " 30 00

Pig Tin.—
Large, 60 ℔.....32c | Small, 30 ℔.....31c
| Bar Tin.....32c

Zinc.—
In casks 1000 ℔s..... c | In sheets.. .....11 c
" 500 " .....10½c | Slab.....9c

Copper.—Copper Bottoms.....35c
Sheathing Copper.....34c
Planished Copper.....41c
" cut to lengths.....45c

Braziers' Sheets, 30x60.—6 to 8 lbs.....41 c
10 and 12 lbs.....38c

Solder.—Extra Fine, C. B. & Co.'s Brand ..25c
Fine, No. 1..... 22c

Antimony......20c

Babbit Metal......15c @ 25c.

Galvanized Iron Conductor Pipe......₩ ℔ 10c

Sheet Iron.—
| Common. | Smooth. | Charcoal.
No. 14 to 24..... | 5 c | 6¼c | 8 c
25 & 26..... | 5½c | 7 c | 8½c
27..... | 6 c | 7½c | 9 c
Add ¼c ₩ ℔ for 30 in. wide.

Galvanized Iron......dis 15 %
No. 16 to 20.....12c | No. 24.....15c
21 to 24.....13c | 26.....16c
25 & 26.....14c

Russia Iron.— | No. 1 Stained.....20c
Perfect.....22c | In Sheets, 1c. higher.

American Russia.— | B.....11c
A.....15c | In sheets, 1c higher.

Lead.— | Lead Pipe, in full coils 10 c
Pig..... 8 c | Lead Pipe, when cut..10½c
Bar..... 9½c | Sheet Lead.....10½c

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 42 to 48 Batterymarch St.)

Augers.—Watrous Ship.....dis 10 %

Axes.—Forester's Favorite, Bronzed.....$12 50
Blue Jackets, Blue..... 12 00
Excelsior, Black..... 11 5
Chopper's Pride, Bronzed..... 11 00
Red Cross, Red..... 10 50
Red Cross, Handled..... 13 50
Boy's Handled Blue Jackets..... 12 00

Blind Hinges.—Washburn's.....per hundred set $9 50

Blind Fasts.—Washburn's.....per hundred set $5 75

Bolts.—Carriage, Phila.. "Girard Works.....dis 50&5 %

Borers.—Angle, Backus'.....dis 30 %

Boring Machines.—Angle.....each $4 75
Common, Snell's quality.....each 3 75

Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 40 %

Butts.—Union Drilled Loose Joint.....dis 60 %
" " Wire Fast Joint.....dis 50 %
" " Acorn Loose Joint...dis 50&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
Wrought Narrow Butts.....dis 30 %

Cartridges.—" U. S. Cartridge Co.".....dis 50 %

Chisels.—"Buck Bros.' Shank Goods....add 20 @ 22½ %
Socket.....add 22½ @ 25 %

Compasses and Dividers.—Bemis'.....dis 35 %
P. S. & W.....dis 25 %

Cordage.—Manila (usual trade dis.).....₩ ℔, 17c
American Tarred Hemp Lath Yarn.....₩ ℔, 10c

Crow Bars.—Iron. Steel Points.....₩ ℔, 5½c
" Sweet" Steel Bars.....₩ ℔ 11c
Brown's Steel Bars.....₩ ℔ 10c
K. P. & Co. Extra Drill Steel.....₩ ℔ 15c

Dividers.—Cook's Nickel Plated.....dis 15 %

Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12 00.....dis 25 %
No. 8, " outside " $18 00.....dis 25 %
Torrey's.....$4 00

Files.—Earl Smith & Co.'s English..... $5 to £ gold
American.....$5 to £ currency, less 10 %
Nicholson.....$5 to £ currency, less 10 %
Stubb's Tapers, genuine, 6 in., $1 50; 5½, $1 62; 4, $1 88; 4½, $2 13; 5, $2 50.

Hammers.—Maydole.....dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $8 75
" " " " " bell face, No. 1, $11; 1½, $9 75. " " " " "

Hangers & Rollers.—Novelty.....dis 30 %
Anti-Friction.....$1 25 per pair—dis 30 %

Hatchets.—Underhill Edge Tool Co.....dis 10 %
Underhill pattern, solid, C. S. lathing.....$9 00
Underhill Bros. pattern, solid C. S. Lathing.....10 00
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4 75; 1, $5 25; 2, $5 75
Claw.....1, 5 75; 2, 6 25
Lathing.....1, $5 50
Axe Pattern.....1, $7 00; 2, 7 50
Broad....0, $5 75; 1, $6 50; 2, $7 50; 3, $9 25; 4, $10 75; 5, $12 75; 6, $14 75.

Hinges.—Strap and T, Stanley Works.....dis 25&7½ %
Plate, Loose and Fast Joint.....₩ ℔ 7½c
Wrought Screw Hook.....₩ ℔ 8c

Hoes.—Ely Balch & Co. M., B. & D.'s list, 1874...dis 25 %
Remington, M., B. & D.'s list, 1874.....dis 30 %
Kimball's first quality, socket..... per doz $6 50
" " " shank..... per doz 6 00

Lead.—Sheet and Pipe.....9c—dis 10 %

Locks.—P. & F. Corbin.....new list dis 45&5 %

Manure Forks.—
Myers & Ervien, M., B. & D.'s list, 1874.....dis 25 %
Peck, Clark & Co., " " .....dis 25 %
Shumway & Co., " " .....dis 30 %

Mattocks.—K. P. & Co.. axe finish, long cutter..$13 75
Short cutter..... 13 50

Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₩ ℔

Nails.—10c and larger.....$4 25

Padlocks.—Wilcox.....dis 50&2 %
All Brass, 2½ inch, 2 keys, job lot.....$9 00

Picks.—K. P. & Co., Polished Points—
5 to 6.....per doz $9 00; 6 to 7, $9 50

Pins.—Universal Hat and Coat—
All wood, 2 in.....₩ gross $2 50; 3 in., 3 50; 4 in., 4 50

Potato Digger.—
" Partridge," 6 square tine.....₩ doz $12 00
Shumway & Co., 6 round tine..... ₩ doz 9 00

Pulleys.—Clark & Co.'s Axle, 2 in.....per doz 42c

Plated Ware.—Rogers Bros.....new list dis 30 %

Plumb & Levels.—"Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels.....dis 50 %
No. 2, First Quality Levels.....dis 60&10 %
No. 3, Iron Pocket " .....dis 35 %
No. 4, Level and Plumb Glasses.....dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge.....dis 50&10 %
No. 6, Improved Iron Bench Planes.....dis 20&10 %

Pocket Knives.—Conn. Cutlery Co.....new net list

Rakes.—Cast Steel, garden.....dis 30 %
Malleable.....dis 25 %

Rail Barn Door.—For Novelty and Anti-Friction Hangers.....per foot 7c., dis 10 %

Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8. 13 13 14 14 15 16c ₩ ℔ net

Sad Irons.—Bless & Drake.....₩ ℔ 4½

Sand Paper—0 to 2, $4 25; 2 to 3, $4 75..new list dis 10 %

Saws.—Disston's.....dis 12½ %
Lightning X Cut, Boynton's.....per foot 6½c
" Saw Blades, 32 inch.....per doz $7 00
" Framed Saws.....per doz 8 50
Common " " .....per doz 6 00
Disston " " .....per doz 9 00
One man X cut.—Lightning.....$2 75 each
Disston's $3 00 each.....dis 12½ %

Screws.—American Screw Co.....revised list dis 62½ %

Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $6 50
" " second quality..... " 3 00

Shovels.—O. Ames.....new list dis 12½ %
M. B. & D.....new list dis 12½ %

Spading Forks.—M. & E.....dis 25 %

Stone Pickers.—"Partridge," original...₩ doz $15 00

Tools.—Aiken's Pattern, 20 in set; Miller's Falls, $12 00 per doz.....dis 15 %

Traps.—Oneida.....dis 20 %
Blake's.....dis 20&5 %

Vises.—K. P. & Co.'s Solid Box, Blacksmith...₩ ℔ 14½c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 15 %

Wardrobe Hooks.—Wire to drive.....₩ gross $1 00

Weights.—Window Weights.....₩ ℔ 2½c

Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black.....₩ ft 6c

Wrenches.—Genuine Wrenches, A. G. Coes..dis 40&5 %

Wringers.—
Novelty and Universal } Tub No. 2 .....per doz $65 00
Novelty Bench, No. 4.....per doz 104 00

Boston Metal Market.

(Corrected by Fuller, Bana & Fitz.)

Tin Plates.—₩ box
I. C. Char. 10x14 @ $12 50
I. C. Coke 10x14.. 11 00
Char. Roof. IC, 10x14, 12 00
Coke " IC, 10x14, 11 00

Pig Tin.— ₩ ℔
Banca..... 34c
Straits..... 29c
English..... 28c

Zinc.—Sheet..... ₩ ℔ 10c

Iron.—Sheet Iron, Russia..... "
Sheet Iron, English..... "
" " American Refined..... "
" " Galvanized..... "
Plate Iron.....
Swedish and Norway Bar Iron, gold.....₩ ton, $130 00
" " Shapes, gold..... 137 50
Norway Nail Rods, first quality, gold..... 142 50
" " second " " 142 50
Best Refined Bar Iron..... 70 00
The "Burden Best" Iron..... 112 00
American Pig Iron, Foundry, No. 1, x.... 36 00 @ 37 00
" " " No. 2, x.... 34 00 @ 35 00
Gray Forge..... 30 00
Scotch Pig Iron.....₩ ton 40 00 @ 45 00
Wrought Scrap Iron..... 35 00

Steel.— ₩ ℔
Eng. Tool..... 18c
American Tool " 15½c
" Mach " 11c
Bessemer..... 7½c

Copper.— ₩ ℔
Sheathing..... 38c
Bolt..... 36c
Ingot..... 36c

Lead.— ₩ ℔
Pig..... 7¼c
Sheet and Pipe..... 8½c

Spelter...... ₩ ℔ 8c

Antimony...... ₩ ℔ 16c

Tin.—
Pig..... 30c
Bars..... 32c
Small " 31c

Sheet Zinc.
Casks.....₩ ℔ 10 c | Sheet.....₩ ℔ 11c

Solder.
No. 1, Refined, in bars or plate..... 20c
No. 2, " " " 18c
Pig Lead..... 7½c

Sheet Copper.—18 to 100 lbs. Sheets 30x60..... 35c
14 to 16 lbs., Sheets 30x60..... 35c
10 to 12 lbs., " and 30x72..... 38c
6 to 9 lbs., " 41c
Tinned, 14 and 16 oz. 14x48..... 34c
Planished, 14 and 16 oz. 14x48..... 41c
" No. 7, 8 and 9..... 43c
Copper Bottoms..... 35c

Sheet Iron.—

| Com'n | Sm'th. Ch'coal | Ingot.
---|---|---|---
No. 16 to 20.... | 5c | 6c | 8c | 10c
No. 22 to 24.... | 5c | 6c | 8c | 10c
No. 26..... | 5¼c | 6¼c | 8¼c | 10¼c
No. 27..... | 5¾c | 6¾c | 8¾c | 10¾c

Galvanized Iron..... dis 15 %
Iron Rivets..... dis 20 %
Iron Wire..... dis 30 %
Coppered Market Wire..... dis 25 %
Copper Rivets and Burs..... dis 10 %
Russia Iron.—Nos. 9, 10, 11 and 12, ₩ ℔..... 23c
No. 1, stained, ₩ ℔..... 20c
Imitation Russia, ₩ ℔..... 16c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Anvils.—Armitage.....₩ ℔, gold, 12c
Peter Wright's..... " 4c
Wilkinson's..... " 2½c

Apple Parers.—Conqueror.....₩ doz, $9 00
Lightning..... " 9 00
Turn Table..... " 9 00

Axes.—Hunt's.....₩ doz $13 00 @ 18 50
Lippincott's..... " 13 00 @ 18 00
Lippincott's Pioneer..... " 13 00 @ 13 50
Simmons'..... " 12 00 @ 13 00

Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles.....new list net
Swelled Taper Axles.....new list net
Concord Axles.....new list net
Red Jacket Axles.....new list net
Common Axles, 1½ inch and upward.....₩ ℔ 8½c
" " less than 1½ inch..... " 8¾c

Bellows.—"Best St. Louis make" 60c ₩ in. dis 20 %

Bells.—Troy, Church.....₩ ℔, 50c
Light Brass, Hand.....dis 50 %
Moore's, Cow.....dis 20 %

Bolts.—Arms, Bell & Co.'s Machine.....dis 20 %
Arms, Bell & Co.'s Carriage and Tire.....dis 75 %

Cast Butt Hinges.—Western Butt Co.'s—
Narrow Fast Joint.....dis 33 %
Broad Fast Joint.....dis 50 %
" Loose " .....dis 60 %
Reversible.....dis 45 %
" Japanned and Silver Tipped.....dis 45 %
Loose Joint "Acorn" " " .....dis 55 %
Excelsior Reversible Blind.....dis 30&10 %
Lull & Porter's Blind.....dis 45 %

Wrought Butts.—Narrow.....dis 25 %
Reversible.....dis 30 %
Broad.....dis 30 %
Table Hinges.....net list
Back Flaps.....net list
Inside Blind Hinges.....net list

Chain.—Eng. Coil..5-16 ⅜ 5-16 ⅜ 7-16 ½ in. 12 11 10 9½ 9 8c gold
Trace.....6½-10-2 70c "
4-10-2 75c "

German Coil and Halter.....revised list add 10 %

Chisels.—Socket, Firmer or Framing.....dis 55 %

Clothes Wringers.—Crown.....₩ doz $60 00
Novelty..... " 72 00
Universal..... " 72 00
Monitor..... " 72 00

Corn Knives.—Dunn E'ge T'ol Co.'s Clip..₩ doz $5 75
Disston's..... " 6 00

Crow Bars.—Steel Pointed.....₩ ℔ 7 @ 9c
Solid Cast Steel..... " 20c

Cutlery.—J. Russell & Co.'s..... } new list, dis 15 %
Lamson, Goodnow & Co.'s..... }
Landers, Frary & Clark's..... }

Files and Rasps.—
Nicholson's Files.....$5 00 less 5 %
Butcher's Mill..... 75 to the £. currency
Heller's & Bros Horse Rasps.....dis 40 %

Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks.....dis 30 %
" " Handled Hoes.....dis 30 %
" " Planter Eye Hoes.....add 5
Winsted's Planter Eye Hoes.....add 5

Hammers.—Yerkes & Plumb.....dis 5 %
Masons' Hammers.....₩ ℔ 20c
Smith Hand Hammers..... " 22c

Handles.—Axe.....Extra. $2 75 | No. 1. $2 25 | No. 2. $1 75 | No. 3 $1 00
Pick..... Extra. $2 50 | No. 1. $2 00 | No. 1½. $1 75 | No. 2. $1 25
Smith & Montross Fork, Hoe and Rake..... dis 30 %
" " Broom and Mop.....$12 @ $18 ₩ M

Harrow Teeth.—1 inch iron.....₩ ℔ 4½c
⅞ and ¾ inch iron..... " 4¾c
⅝ inch iron..... " 5 c
Barbed or Headed.....⅛c extra

Hatchets.—Hunt's.....dis 10 %
Simmons'.....dis 15 %

Hay Knives.—Lightning.....₩ doz $22 00
Dunn Edge Tool Co.'s.....₩ doz $14 50—dis 15 %
Fisher's..... " 16 50—dis 10 %

Hinges.—Strap and T—St. Louis make.....dis 25 %

Horse Nails.—Eureka.....23c rate
Ausable.....22c "
Northwestern.....22c "
Eagle.....19c "
National Patent Pointed.....21c "
" " Extra Finished.....22c "

Horse Shoes.—R. I. (Perkin's pat.).....₩ keg $6 50
Burden's..... " 6 50
Mule Shoes..... " 7 50
Rhode Island Trotting Shoes..... " 9 00

Locks and Latches.—
Jones & Nimick's.....revised list dis 40 %
Moorhead, Adams & Co.....revised list dis 40 %
Norwalk Lock Co.'s.....revised list dis 40&5 %

Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks...₩ doz. $15 00 @ 16
" Grub Hoes, Oval Eye...₩ doz. 12 00 @ 13 00

Nails.—Wheeling.....$4 00 rates
Orders for 100 kegs 10c ₩ keg less.

Picks.—Klein, Logan & Co.'s R. R. and Clay ₩ doz.$12 00
Klein, Logan & Co.'s Coal..... " 9 75
" " Foil..... " 12 00
" " Stone..... " 16 50
" " Tamping..... " 19 00

Planes.—Ohio Tool Co.'s.....dis 25 %
Sciota.....dis 30 %

Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32.....dis 20 %
Barton's Patent.....₩ doz $35—dis 20 %
Vaughn's " .....25—dis 10 %

Sad Irons.—Monitor Brand. Silver Polished..₩ ℔ 4½c

Sash Weights.—Standard Solid Eyes.....₩ ℔ 3½c

Saws.—Disston's.....dis 10 %
Hubbard, Lippincott, B. & Co.'s.....dis 10 %
Branch, Crooks & Co.'s.....dis 15 %
Livingston's Patent Buck.....net list

Screws.—American Screw Co.'s revised list....dis 50 %

Scythes.—
Dunn Edge Tool Co.'s.....new list dis 25 %
Paris Furnace Co.'s.....dis 50 %

Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00
Extra Indian Pond..... " 7 50
Premium..... " 9 50 } dis 25 %
Diamond Grit..... " 13 50

Shovels, Spades and Scoops.—
Ames'.....dis 7½
Lippincott's.....new list dis 15
Rowland's, Maxwell.....revised list dis 12½

Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ ℔, 17c
Solid Cast Steel..... " 35c
Striking Sledges.....₩ ℔ extra, 1c

Snaths and Cradles.....dis 25 %

Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 70 %
Blue Seat Springs.....new list dis 15 %

Tacks.—Norway Tack Co.'s ½ weight.....dis 70 %
Brads ½ weight.....dis 50 %

Thimble Skeins.—Pump & Skein Co.'s....dis 50&10 %

Traps.—Newhouse Patent.....dis 15 %

Vises.—Solid Box.....₩ ℔ 16c
Wilson Mfg. Co.'s.....dis 15 %

Wrenches.—Coes' Genuine.....dis 33½ %
Coes' Pattern.....dis 50 %
Taft's.....dis 60 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.

Tin Plate.
IC, 10x14, Charcoal...$12 50 | IC, continuous, 20 in. x 200 ft.....
IX, 10x14, " ... 15 50 | IX, continuous,
IC, 12x12, " ... 13 00 | 20 in. x 200 ft.....
IX, 12x12, " ... 16 00 | IC, 10x14, best Coke...$11 50
IC, 14x20, " ... 13 50 | IC, 10x14, good " ... 11 00
IX, 14x20, " ... 16 50 | IC, 10x20..... 19 00
IC, 14x20, Terne..... 12 00 | IX, 14x20..... 11 50
IX, 14x20, " ..... 14 50 | IC, 14x20, Coke Lead. 9 50
IC, 20x28, " ..... 25 00 | IX 20x28, Coke Lead. 11 50
IX 20x28, Terne..... 20 00 | IC, 10x14, punch'd for Safes..... 10 00

Block Tin.
Large Pigs.....30c | Bars.....32c
Small " .....31c |

Sheet Zinc.
Casks.....₩ ℔ 10 c | Sheet.....₩ ℔ 11c

Solder.
No. 1, Refined, in bars or plate..... 20c
No. 2, " " " 18c
Pig Lead..... 7½c

Sheet Copper.—18 to 100 lbs. Sheets 30x60..... 35c
14 to 16 lbs., Sheets 30x60..... 35c
10 to 12 lbs., " and 30x72..... 38c
6 to 9 lbs., " 41c
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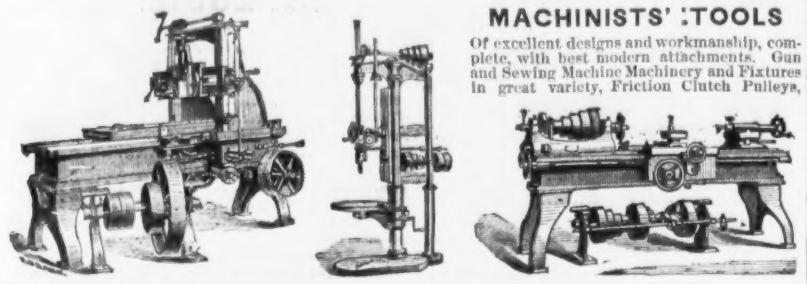

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Of excellent designs and workmanship, complete, with best modern attachments. Gun and Sewing Machine Machinery and Fixtures in great variety, Friction Clutch Pulleys,

Water-Power Organ Blowing Apparatus, Special Machinery, &c., made by

THE PRATT & WHITNEY COMPANY Hartford Conn.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order.

The "EMPIRE," a Fan Blowing

PORTABLE FORGE,

(Patent Applied for.)

Without BELTS or BELLOWS.

It is more **Easily Worked**, gives a **Better Blast**, and is the **Cheapest** forge made, and

☞ It has no Back Draught.

W. P. KELLOGG & Co., Troy, N. Y.

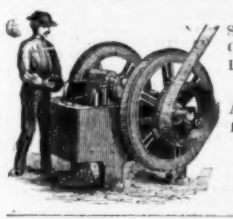
And 84 Chambers St., N. Y.

Also **Curry Combs, Boring Machines,** and **Cooley's Whip Racks, etc., etc.**

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds o hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

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BLAKE CRUSHER CO., New Haven, Conn.

Persons visiting New York, can be shown a crusher in operation at 137 Elm St

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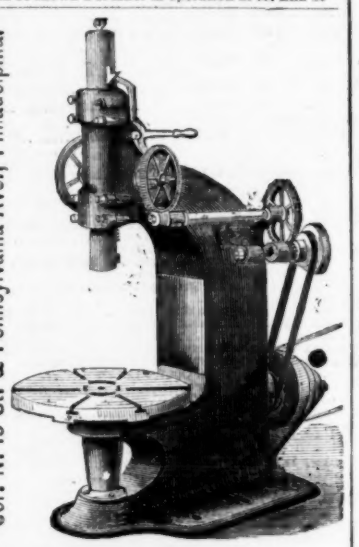
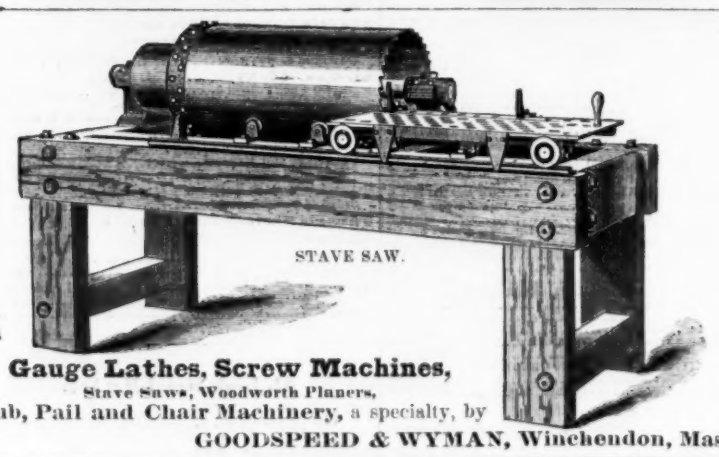
E. HARRINGTON & SON,

Manufacturer of **ENGINE LATHES,** from twelve (12) to forty-eight (48) inches swing; **Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press** for Mandrels; **Grindstone Boxes.**

Cor. N. 15 St. & Pennsylvania Ave., Philadelphia.





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Stave Saws, Woodworth Planers,

Tub, Pail and Chair Machinery, a specialty, by

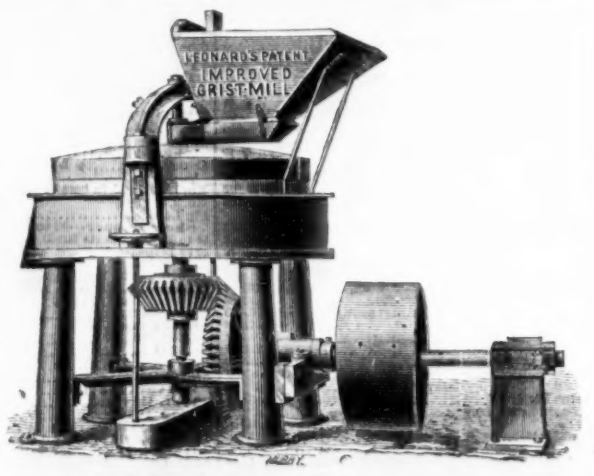
GOODSPEED & WYMAN, Winchendon, Mass.

Burr Stone Flouring & Grist Mills.

LEONARD & SILLIMAN, Manufacturers,

BRIDGEPORT, CONN.

Send for Illustrated Catalogue and Price List



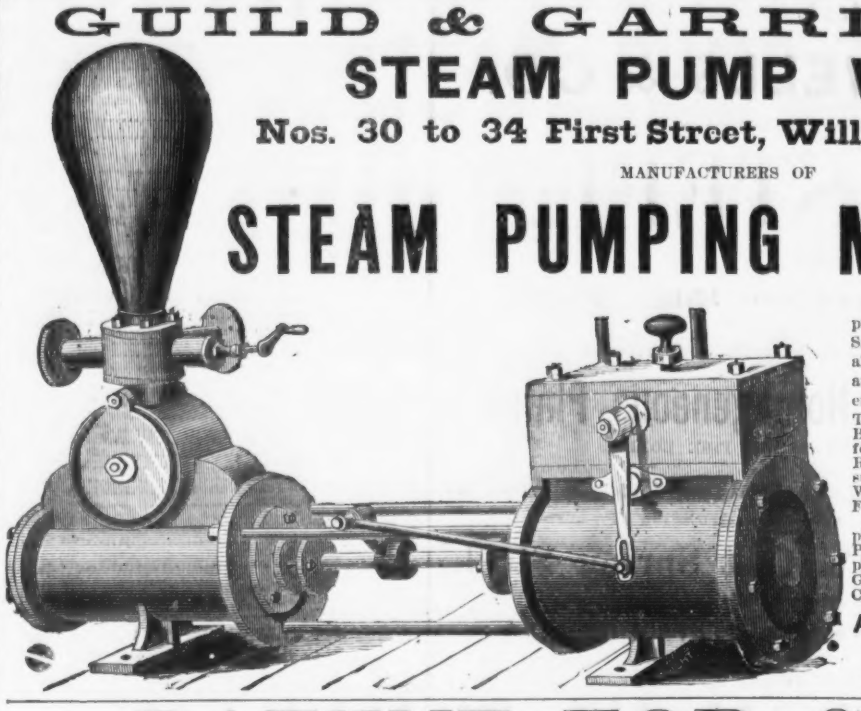
GUILD & GARRISON'S

STEAM PUMP WORKS,

Nos. 30 to 34 First Street, Williamsburgh, N. Y

MANUFACTURERS OF

STEAM PUMPING MACHINERY



Of all descriptions and for all purposes, of any proportion or size, for pumping Hot, Cold, Fresh, Salt, Muddy or Gritty Water, Grain-mash, Syrups all kinds of Beer, Acids, Molasses, and all heavy and thick fluids. Also for Feeding Steam Boilers, Supplying Tanks, and for Sugar Refineries, Tanneries, Oil Refineries, Gas Works, Hotels, Breweries, and for all classes of manufactories: for Draining Mines and Excavations, and for Rolling Mills, Blast Furnaces and Water Works supplying Cities, Towns and Villages with Water; also, for Wrecking purposes and Steam Fire Engines for Land and Sea.

Also, Manufacturers of Vacuum Pumps, Duplex and Single, and Copper or Iron Vacuum Pans of all sizes and for all purposes, with complete fixtures for Refining Sugar, Corn Syrup, Glue, &c., or for condensing Milk, Extracts, Chemicals, &c., &c.

All Work from this Establishment fully Warranted.

Catalogues mailed on application.

PATENT FOR SALE.

$12,000

If Closed before June 1st, will buy the Patent,

AND $1000 WORTH OF ESPECIAL TOOLS,

ON THE

DANBURY DRILL CHUCK.

Only cause of selling, owner has a larger and more important enterprise on hand, which will require his whole attention and the above amount of extra cash. **"The Danbury"** is now *everywhere* acknowledged to be the best Chuck for all purposes ever put on the market, has had a large and rapid sale, being a decided "take" from the first. $20,000 would not buy it, except for reasons named. Can show clearly where over $10,000 per year can be made out of it, the principle being perfectly adapted to every thing, from a dental or jewellers' drill to a car wheel Chuck. Unless sold before June 1st, it will not be for sale. For illustrated descriptive list and further information, address the

Manufacturers, F. A. HULL & CO., Danbury, Conn.

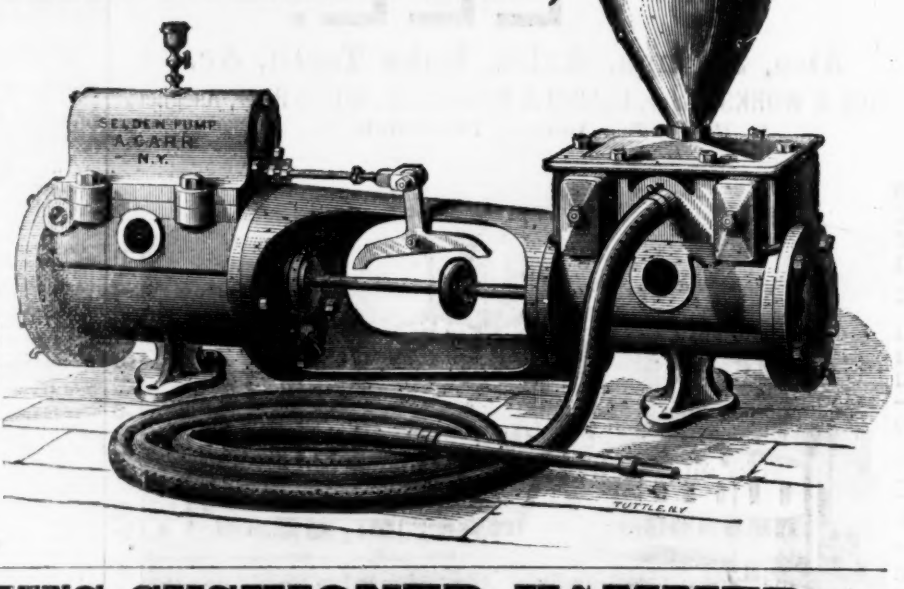
SELDEN PATENT

DIRECT ACTION STEAM PUMP,

Patented August 2nd and December 20th, 1870.

Tank Pump, with Boiler Feed Attachment.

For Boiler Feeders,
For Water Works,
For Fire Pumps,
For Mines, etc., etc.



And for all purposes for which Steam Pumps can be used. Sold under full guarantee. Money will be returned if, from any cause, they should prove unsatisfactory. Send for Circular and Price List, fully describing them, to

A. CARR,
43 Cortlandt Street,
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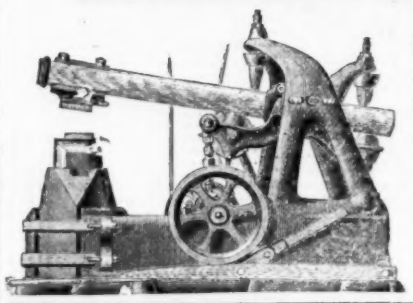
BRADLEY'S CUSHIONED HAMMER.



This Hammer has many valuable improvements made useful in the device for cushioning the blow, thereby relieving all the working parts from that jar and concussion which is the destroying element of other Helve Hammers. It is made Adjustable in Line of Action, Length of Stroke, Rapidity of Motion, and Weight of Blow, all of which are controlled at the will of the operator. They have ***Larger Capacity, Cost Less,*** are more ***Durable,*** take up ***Less Room,*** do ***More*** and ***Better Work*** at ***Less Expense*** for Power than any other Hammer in use. We guarantee them fully as recommended. For particulars, address

Bradley Manufacturing Co.,
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Woodruff Iron Works,

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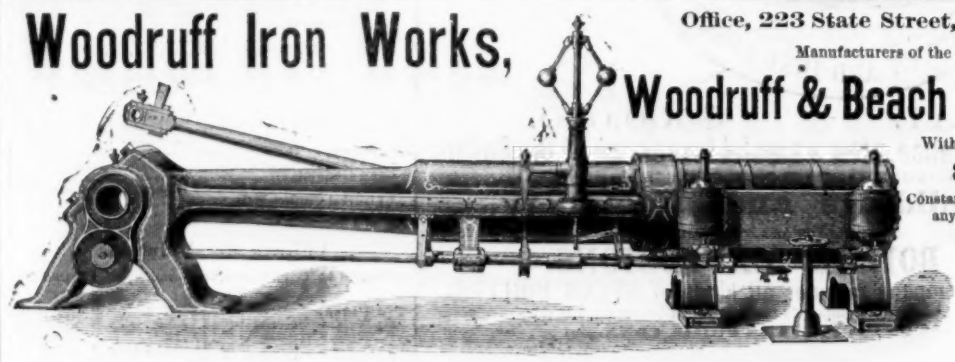
Manufacturers of the Celebrated

Woodruff & Beach Steam Engine,

With recent valuable improvements.



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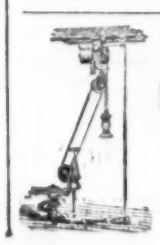
Constantly on hand and made to order of any size or style. Special attention given to the manufacture of

MILL WORK

And all kinds of Machinery.

CASTINGS

Of any size or style.



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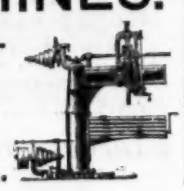
Portable, Radial, Multiple, Vertical, Horizontal, Special.



THORNE, DeHAVEN & CO.,

21st. St. above Market St., Philadelphia.

TACKLE BLOCKS.

BURR & CO

Manufacturers of Waterman and Russel'

PATENT IRON STRAPPED BLOCKS,

ALSO, MANUFACTURERS OF

ROPE STRAPPED BLOCKS,

31 PECK SLIP, NEW YORK.

Machinery, &c.

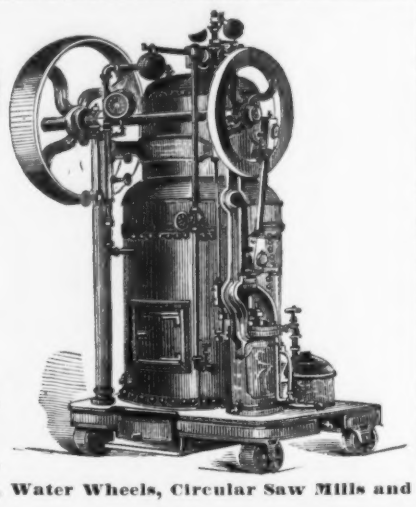
ANDREW WATSON,
MACHINIST and ENGINEER,
Nos. 537 & 539 Dickinson Street,
Near Trenton Avenue, 19th Ward, PHILADELPHIA.

Builder of ***Vertical Steam Engines and Boilers,*** peculiar for their economy of space and fuel, safety and quickness in raising Steam. Also, sole manufacturer of ***Improved Balance Governor*** with automatic stop, ***Balance Slide Valve, Safety Valves, Stop Valves, Improved Pistons for Engines,*** which require no setting by the Engineer. Engine Builders and Dealers supplied with ***Governors, Stop Valves, Safety Valves, &c., &c.*** These governors are fitted up in the very best manner, with brass Valves and Seats, which will not corrode or stick fast. Guaranteed to regulate under any irregular load which an Engine is subject to. Millwright work executed, and Machinery in general satisfactorily repaired.

Engines Indicated Promptly and with the Greatest Accuracy.

Ludlow Valve Mfg. Co.,
OFFICE AND WORKS:
938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,
MAKE
VALVES
(Double and Single Gate, ¼ in. to 36 in.—outside and inside Screws, Indicator, &c.)
for Gas, Water and Steam.
Send for Circular. ***Also FIRE HYDRANTS.***

THE
Shapley Engine

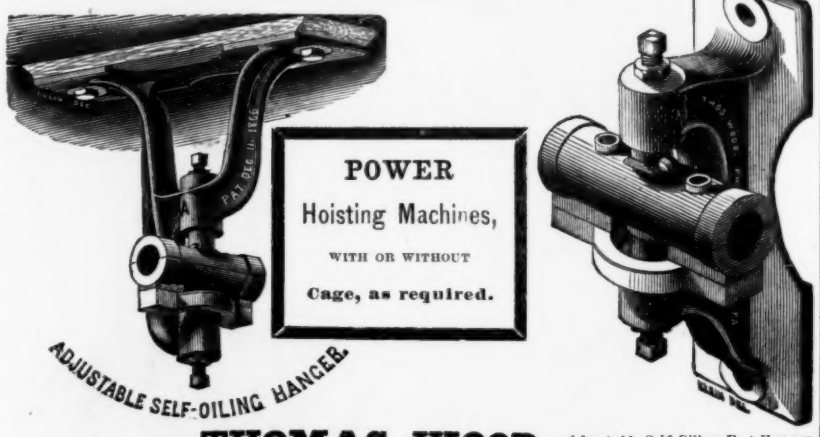


Patented Feb. 10, 1874.

COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.
$200·00.
Cheaper than any Engine offered of the same capacity.
MANUFACTURED BY
SHAPLEY & WELLS.
Binghamton Iron Works,
Binghamton, N. Y.

Manufacturers of **Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.**

Fairmount Machine Works,
Office, 2106 Wood St., Philadelphia, Pa.



THOMAS WOOD,
Adjustable Self-Oiling Post Hanger 6 in. from post to center of shaft.

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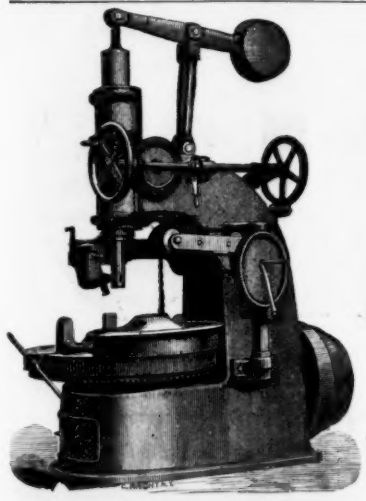

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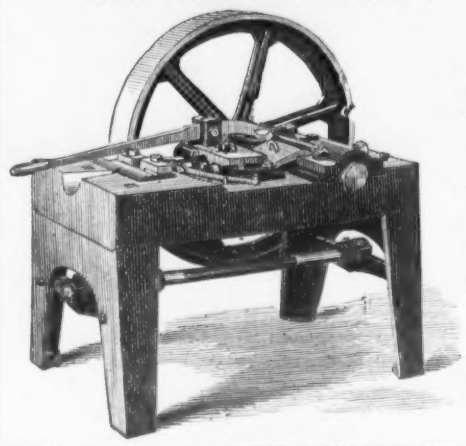

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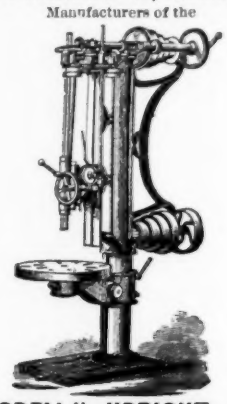

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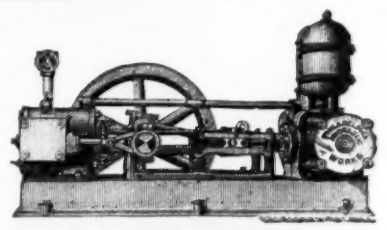

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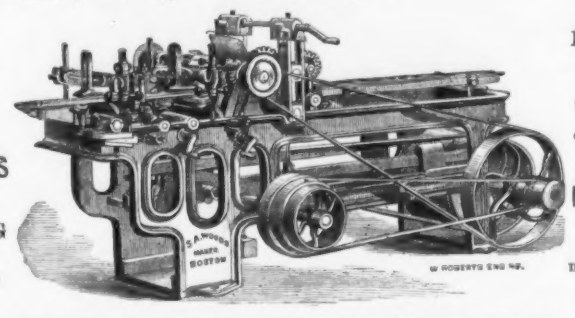

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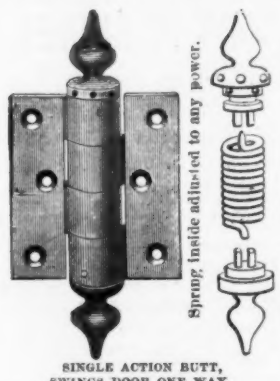

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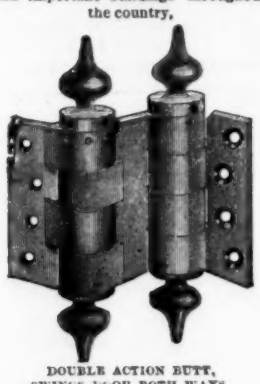

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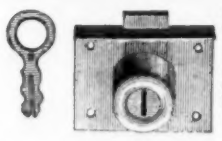

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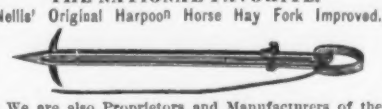

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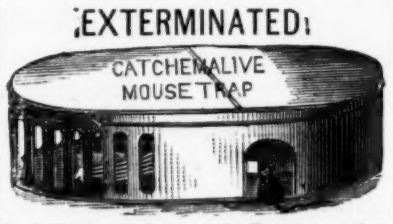

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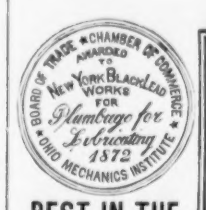

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